the Iron Age

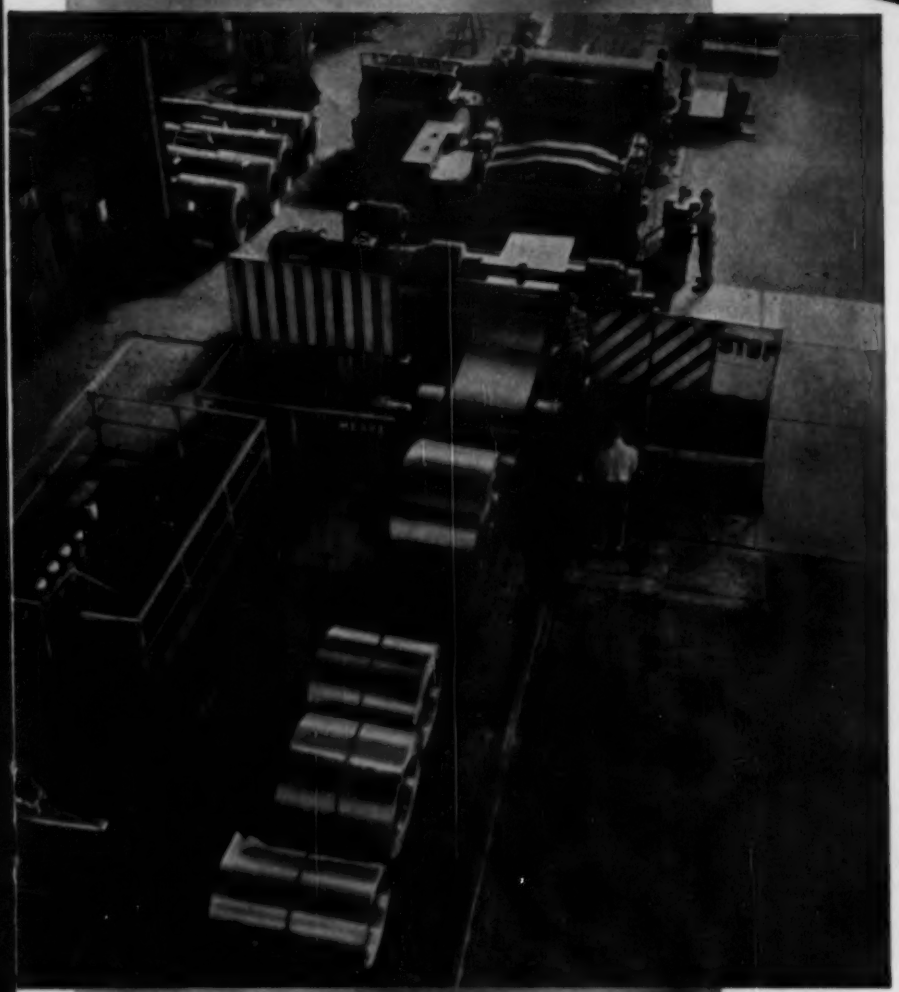
A Chilton Publication

THE NATIONAL METALWORKING WEEKLY • SEPTEMBER 15, 1955

What's behind the copper price rise?
See page 95

Shearing* LINES

Designed and Built by MESTA



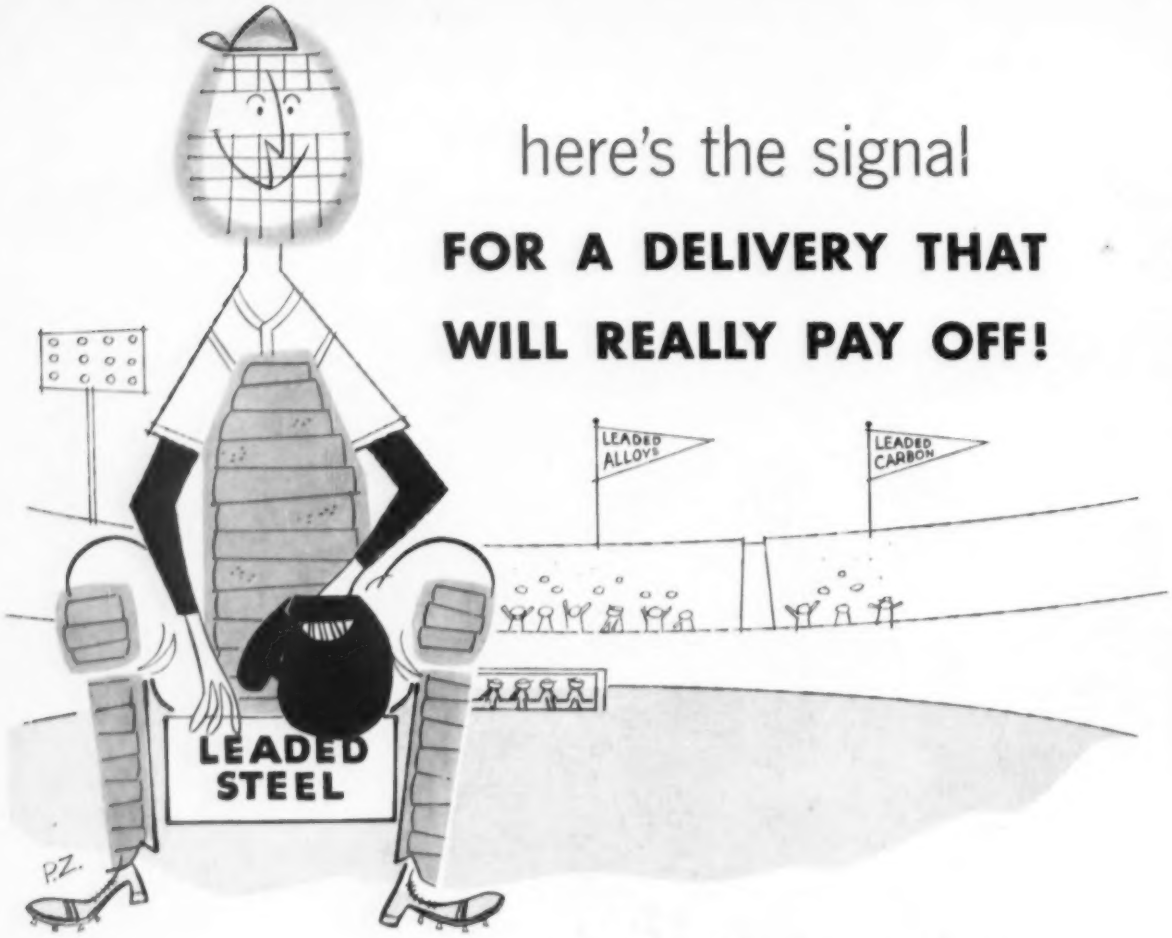
* HIGH-SPEED SHEARING, SIDE TRIMMING AND SLITTING EQUIPMENT FOR SHEET AND TIN GAUGE STRIP STEEL

MESTA 93" SHEET SHEARING LINE WITH TRIMMER AND COMBINATION FLYING SHEAR AND LEVELLER

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA



here's the signal

FOR A DELIVERY THAT WILL REALLY PAY OFF!

Are high machining and tool costs knocking profit out of your daily battle for quality production?

Then here's the pitch—Try Aristoloy leaded steels. The faster feeds and speeds, freer machining and longer tool life of these steels will strike out excess tool costs and put production line breakdowns out of the game.

Copperweld Aristoloy Leaded Steel is truly "the steel with built-in productivity."

ARISTOLOY STEELS

For further details write for free booklet "Lead Treated Steels"

COPPERWELD STEEL COMPANY · STEEL DIVISION · WARREN, OHIO

Tool Steel Topics

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

2 Fine Tool Steels Team Up to Make Compound Die

This compound blanking, forming and piercing die is used by National Motor Bearing Co., Redwood City, Calif., in the production of cup cases for oil seals. The die is made up of two grades of Bethlehem tool steel: BTR and Lehigh H.

Hardened to Rockwell C 60-61, the long-wearing die forms the cup cases from plain carbon steel, stainless steel, and brass sheets. They range in diameter from ½ in. to 14 in., and in thickness from 0.030 in. to 0.090 in. The die produces parts to tolerances of plus or minus 0.002 in., and produces up to 75,000 pieces before slight redressing is required.

BTR (Bethlehem Tool Room) is our general-purpose, manganese-chromium-tungsten grade of oil-hardening tool steel. Its main feature is its safe-hardening property. This, coupled with its sound combination of wear-resistance and toughness, makes BTR an ideal steel for all general-purpose tool and die applications.

Lehigh H is a high-carbon, high-chromium tool steel. It offers maximum wear and minimum distortion in heat-treatment. It is also a deep-hardening steel, in air, and thus has high compressive strength.

Your tool steel distributor will be pleased to furnish additional information about these fine Bethlehem tool steels. He'll welcome your call, right now.

BETHLEHEM TOOL STEEL ENGINEER SAYS

Why and How to Stress-Relieve Tools

Stress-relieving is performed on tools to partially remove residual stresses resulting from machine work, mechanical straightening, hobbing, or other cold working. The reduction of stress is important in avoiding excessive distortion during tool hardening, as well as in avoiding the cracking that results from the addition of residual stress to the thermal stress produced when heating to the hardening temperature.

Stress-relieving is accomplished by heating the steel to from 1100 to 1300 F. Because of the relatively low temperature, surface protection against scale or decarburization is usually not required. As the temperature used is always below the transformation range of the steel, the rate of cooling is unimportant, except that it must not introduce thermal stress during cooling. Only a portion of residual stress is removed by this procedure. Up to the lower critical, the higher the stress-relieving temperature, the more completely is the stress removed.

The degree of stress-relief afforded in this manner is usually sufficient. However, if complete relief of stress is required, a full anneal practice should be employed, including full austenitization and slow furnace-cooling.

TUBE MANDREL FOR SERVICE IN EXTRUSION PLANT

Shown during a finishing cut, this tube mandrel will see service in the extrusion plant of Kaiser Aluminum & Chemical Corp., Halethorpe, Md. The mandrel is made of Bethlehem Cr-Mo-W (chrome-moly-tungsten) tool steel. Cr-Mo-W is an all-around hot-work steel containing 5 pct chromium. It is especially suited for jobs that involve shock and drastic temperature changes, as well as for jobs where heat-checking is a problem.

the Iron Age

Vol. 176, No. 11 September 15, 1955

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NEWS DEVELOPMENTS

MACHINE TOOL SHOW STIMULATES MARKET — P. 91
Chicago Show stirs more buying interest than most optimistic predicted. Purchasers sent top brass and key technical personnel, started figuring buying plans after catching new developments. Small manufacturers showed interest in automatic loaders and other automatic attachments. Production Engineering Show also attracted heavy inquiries.

U. S. NEEDS GREATER STEEL CAPACITY — P. 94
BDSA predicts U. S. will need 150 million tons of steel capacity by 1960, supported by sufficient raw materials and blast furnace capacity. Result will be request for fast tax write-offs to encourage new expansion. Defense demand expected to remain at 18 million tons barring unforeseen developments.

REPORT ON A CRITICAL COPPER SITUATION — P. 95
Since 1940 copper mining in this country has not been able to keep up with rising domestic demand. There are a number of reasons but the sad fact is that it never again will. Consumers must look to imports and here is where their real trouble begins. Local politics in foreign producer, unstable economies and wide differential in world price make for a bleak outlook. Hope lies in the reputation of the American dollar—and a higher U. S. copper price.

AUTO UNION LOOKS TO '58 FOR NEW GAINS—P. 108
Recently signed contract between Chrysler and UAW follows Ford-General Motors pattern. Key point in all is expiration date of June 1958. This means the union will again be able to play one company against the other. Automakers hope to present a solid front as they battle strong new demands.

CAPITOL SEES PRESIDENT STRONG AND FIT — P. 113
Attempts to make President Eisenhower's age and health an election issue are doomed to failure. Associates call the President's health fine, point to many older men holding down important spots in this country and abroad. And Democrats are in no position to call for retirement of leaders over 65. Among their key men up for re-election are House Speaker Rayburn (73) and Senate Leader George (77).

IN METALWORKING

ENGINEERING & PRODUCTION

STRESS ANALYSIS PRETESTS PERFORMANCE — P. 131
Whether you make lawnmowers or locomotives—whatever your product—modern stress-analysis techniques might show you how to build it more economically and make it serve your customers more dependably. Here's how a stress analysis program at Ford Tractor Div. resulted in a much-improved hay rake design.

OXIDE SEALER IMPREGNATES CASTINGS — P. 135
A fast-acting metal oxide type sealer teamed with a high speed washer-drier unit permits aluminum diecastings to be impregnated at rates to 600 per hour. Castings withstand pressures to 4000 psi without leaking. The sealer actually enters micropores. Chemical reaction between the metal oxides in the sealer and the parent metal forms a strong metal-to-metal bond.

CHIP PROCESSING SYSTEM PAYS OWN WAY — P. 138
Savings obtained from a well-planned chip processing system are expected to pay for the installation in two years. Cleaned and crushed chips are blown directly into freight cars. Processed chips command higher prices, permit more to be loaded per car.

BOOSTING GENERAL-PURPOSE-TOOL OUTPUT—P. 141
Demand for high production from general purpose machine tools leads to some ingenious setups. Here is how Clark Equipment tooled some standard lathes and drill presses to make gear transmission components, using special lathe arbors, multi-spindle drilling heads, and indexing tables.

MACHINE PRESSURE WELDS WITHOUT FLASH—P. 144
Track roller shafts are produced at International Harvester's Tractor Works by pressure-welding cupped-end forgings together to leave a recess for lubricant. But pressure-welding after heating with a hand-oscillated oxyacetylene ring burner left internal flash. A special induction welding machine now joins cupped ends, speeding production and eliminating the flash problem.

MARKETS & PRICES

WATCH FOR POSSIBLE FREIGHT CAR SHORTAGE—P. 97
There's a good chance of a freight car shortage this fall and spring. Car builders are plagued by tight steel market and added factor of flood emergency steel requirements. Rails may seek Government aid to get steel priorities. Car deliveries lagged in July despite heavy order volume. Fast tax hassle affects order placement.

CONGRESS TURNS SPOTLIGHT ON CAR DEALERS—P. 99
A Senate subcommittee is quizzing auto dealers on marketing problems Congress wants to know about discount selling through unauthorized retailers. Dealers are being asked about franchise protection, "phantom" freight charges and overproduction. National Automobile Dealers Assn. has already called for new protective laws.

NEW EXPANSION MAKES THE WEST GOLDEN — P. 117
Farwestern markets are attracting more and more interest from manufacturers. Big population growth of the area is drawing a wide variety of metalworking firms. Capacities of existing plants are being increased. And the move is tending to perpetuate itself as new developments build up more business for suppliers.

RECORDS WILL FALL IN STEEL SOON — P. 187
Steel output and orders will top any previous 4 month period during the last part of this year. But orders will stay ahead of output with a huge carryover into 1956. Demand from automakers will pace this fall's activity with construction and warehouses a close second.

THE BIG SWITCH TO ALUMINUM FROM COPPER—P. 194
Rumors have been flying and it seems they are all true. The instability of copper supply is pushing fabricators of wire and cable to investigate possibility of using aluminum. Order books will reflect this switch beginning first quarter of 1956. The question is: How big is big?

NEXT WEEK:

HOW TO FIGURE YOUR INDUSTRIAL TRUCK COSTS
Tracking down the cost of owning and operating industrial trucks is not easy, but will pay off in reducing overall operating expense. Realistic cost figures can tell you when to replace equipment, can locate high-cost handling areas and help point the way to more efficient industrial truck use.

HOW ELECTION POLITICS WILL AFFECT BUSINESS?
With elections approaching, what action can you expect on labor, tax and other issues vital to business? Will the Administration bend over backwards to avoid charges of big business government? Will the Democrats push a program of their own? Next week's report tells how both parties are lining up.

CARBURIZING

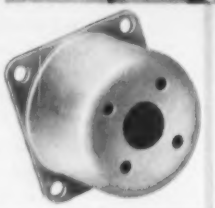
1 This is the operation for which the Leland salt bath was originally purchased. Work is heated at 1650° for 30 minutes, oil quenched and washed. A consistent, scale-free 0.005" case with surface hardness of R_{15N} 75/80 is obtained.

SIMULTANEOUS BRAZING AND CARBURIZING

2 Simultaneous brass brazing and carburizing cut cost from $79 to $13.11 per 1,000 parts, eliminated 3 handling operations, saved time. Average strength of brazed joints is 40,000 PSI. Case depth is 0.005"—0.007" with R_{15N} 80/85 surface hardness.

BRAZING

3 Ajax Salt Bath brass brazing of this assembly reduced costs from $14.20 to $9.10 per thousand—without considering the reduction in rejects from 25% to less than 1% and elimination of 3 additional treatments previously needed with copper brazing.



HARDENING

4 SAE-1050 and 1065 cold rolled parts are hardened in the same Ajax bath used for the 3 other operations. Hardened parts will bend 45° before fracturing. The "pick-up" of a superficially carburized case is not objectionable.

4 Cost-Cutting Operations with One AJAX Salt Bath

. . . that saved $37,000 the first 8 months!

Write for details outlining the G. H. Leland Inc., multi-use operation of its Ajax salt bath.

Let Ajax engineers demonstrate similar heat treating savings. You get actual proof on your own work samples in the Ajax Metallurgical Service Laboratories. No cost or obligation.

During its first 8 months on the job, this Ajax Electric Salt Bath Furnace saved $37,000 in the plant of G. H. Leland, Inc., Dayton, Ohio. This saving was figured after deducting *all* operating costs and 20% annual equipment depreciation!

Or, to put it another way, the amazing versatility of the Ajax furnace installation *enabled it to pay for itself in just a few months of use!*

Not only does the Salt Bath handle all four heat treating operations described and illustrated above . . . but the Leland model shop uses it for odd jobs as well.

Work is scale free. Distortion is no longer a problem . . . and the firm's entire parts processing has been effectively streamlined.

AJAX HULTGREN

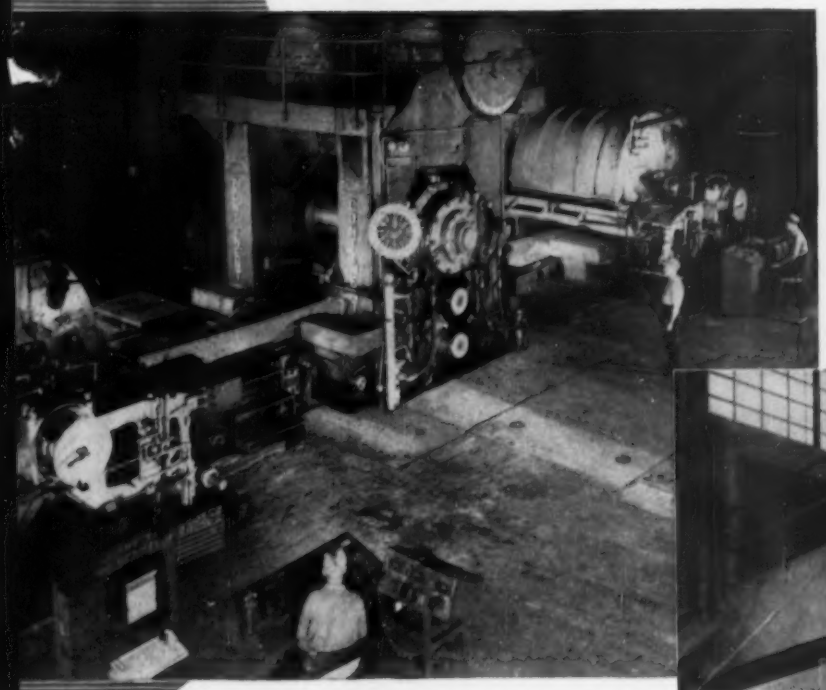
AJAX ELECTRIC COMPANY
904 Frankford Ave. Philadelphia 23, Pa.

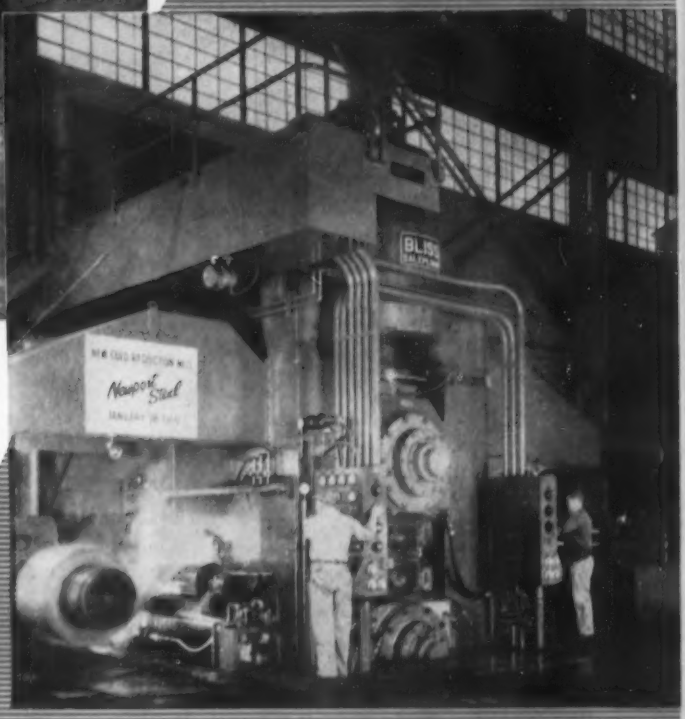
electric SALT BATH furnaces

Associated Companies: Ajax Electric Furnace Corp. • Ajax Electrothermic Corp. • Ajax Engineering Corp.

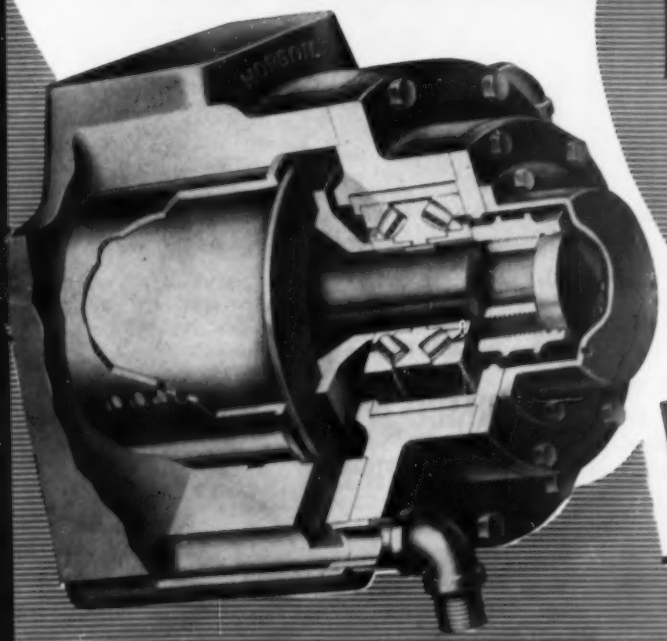
REVERSING MILLS

HOT or COLD





Give Top Performance with MORGOILS



The recent modernization at NEWPORT STEEL CORPORATION, Newport, Kentucky, features a four-high reversing hot mill with Steckel-type furnaces and a four-high cold reduction mill. BOTH mills are equipped with MORGOIL bearings for maximum efficiency.

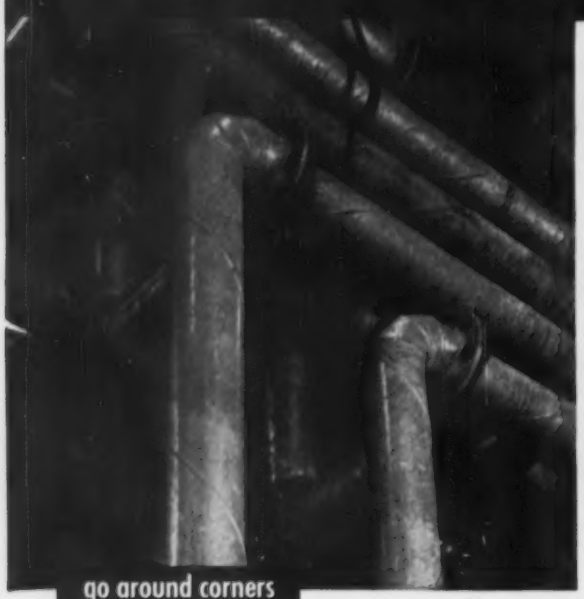
MB-29

MORGAN WORCESTER

ROLLING MILLS · MORGOIL BEARINGS
GAS PRODUCERS · WIRE MILLS · EJECTORS
REGENERATIVE FURNACE CONTROL

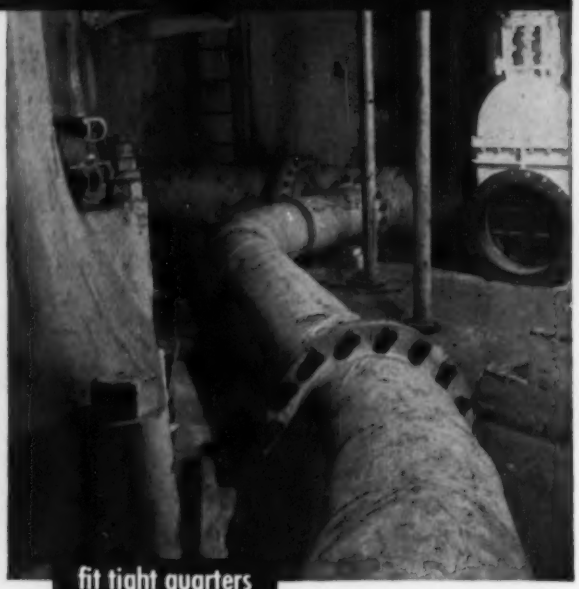
MORGAN CONSTRUCTION COMPANY
Worcester, Massachusetts
English Representative
International Construction Co., 56 Kingsway, London W. C. 2, England

With this steel pipe it's easy to ....



go around corners

Elbows, tees and other fittings come welded to straight runs of Armco Steel Pipe. This saves a pair of flanges at every turn and reduces installation time.



fit tight quarters

When you must design piping around obstructions or in restricted space, Armco simplifies the job because they fabricate pipe and fittings to fit your plans exactly.

travel long distances

Long, 50-foot lengths of Armco Steel Pipe make short work of water, oil and gas lines. Installation is quick, because there are fewer sections to handle; fewer joints to make.

meet your exact needs

The wide range of diameters (6 to 36 inches) and wall thicknesses (9/64- to 1/2-inch) makes it easy to get exactly the plant piping you need without buying excess metal. Also ask about Armco Foundation Pipe and Pile Shells.

Write for complete information. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 4595 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO WELDED STEEL PIPE

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GRanite 4-5600

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Indexed in the Industrial Arts Index and the Engineering Index.

ABP NBP

Editorial:

What Did Geneva Mean To You?

◆ AS AN ENGINEER, production man, purchasing agent, or salesman, your views about Communists are important. They carry an impact upon your family and upon your associates.

Your study of international affairs is as important as your preparation for a technical installation, a production program, a procurement policy, or a promotion campaign. Your position, your public statements and your behavior as they relate to international affairs influence others far more than you may admit—or realize.

If you believe that the Geneva "spirit" calls for relaxation of caution or watchfulness, others will follow you. If you believe that peace is here at last, you will take others down a false trail of complacency.

If you think we spend too much for defense; if you believe good manners mean a complete change in personality; if you believe the Reds have changed their basic aims of world domination; if you believe East-West trade, where the Reds get strategic materials, means peace; if you believe Russian "cuts" in armed manpower mean anything—then you are reacting just as the Kremlin dictators want you to react.

If you feel a slight tug towards any of these views, remember these facts about Communism:

Russia and China are controlled by brutal dictators. Geneva has not loosened their hold one bit.

Satellites are still slave nations under the heel of the Reds. Geneva has not meant freedom or free elections for them.

Peace talk, "travel" in Russia and "relaxation" of censorship are cheap but prove nothing. The hearty dose of jovial hobnobbing with the Kremlin masters did nothing to aid the 15 million slave laborers in Russia.

History shows the Russian Reds have broken every agreement they made save a few. Cold logic indicates 25 to 1 they will break their "word."

Geneva should cause us to be on guard more than ever. We should keep our armed strength at peak levels. We should increase our faith in God and in democratic principles.

We should tear Red propaganda apart piece by piece, if we aren't to be taken over. We should have clearly proven acts from the Reds —not talk and "agreements."

Tom Campbell

EDITOR-IN-CHIEF

HEAP BIG BLOWOUT!

Heap big "blow-out" – and *how!* It's our 40th birthday . . . and this is a good time to say "many thanks" to our customers. And to those folks who we hope will be customers in the many moons to come, may we say "You can always count on Keokuk Silvery Pig Iron. Car for car, pig for pig, its uniformity *never* varies. Charge it by magnet or count!"

Gratefully,

Chief Keokuk
Princess Wenatchee
X (Chief Keokuk Jr.)

Keokuk Silvery . . . the superior form of silicon introduction . . . available in 60 and 30 lb. pigs and 12 ½ lb. piglets . . . in regular or alloy analysis. Keokuk also manufactures high silicon metal.

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332 S. Michigan Ave., Chicago 4, Illinois
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8230 Foreyth Blvd., St. Louis 24, Missouri

dear editor: *letters from readers*

Thermit Welding

Sir:

I have read with much interest an article entitled "Machinery Repairs by Thermit Welding Withstand Severe Service," which appeared in your July 21st issue.

I would like to know who sells or knows about this thermit welding equipment. *Carl Lenz, Allied Products Corp., Research & Development Div., 12677 Burt Rd., Detroit.*

Further information may be obtained from Metal & Thermit Corp., 100 East 42nd Street, New York 17.—Ed.

Iso-Mite

Sir:

We have read in the August 11, 1955, issue of THE IRON AGE an article which appears on page 87 concerning a new powdered material called Iso-Mite. As stated in your article this material is a product of the Iso-Mite Corporation of Los Angeles.

We would like to obtain further information on this material. Would you please furnish us with the Los Angeles address of the Corporation? *G. B. Sheppe, Secretary-Treasurer, Comas Machine Company, Inc., 500-526 College Avenue, Salem, Va.*

The address of The Iso-Mite Corporation is 4470 East Washington Boulevard, Los Angeles.—Ed.

Aluminum Casting

Sir:

We noted on page 153, THE IRON AGE Newsfront, of your August 25th issue, a short note mentioning that continuous cast aluminum shapes are now in pilot production in the midwest.

We are very much interested in all new developments in continuous casting. However we had not heard of any new aluminum casting developments and we wonder if you can give us any further information on it. Can you tell us where this is being carried out and what process is being used? *J. T. Lumis, Continuous Metalcast Co., Inc., 44 Wall Street, New York.*

Further information may be obtained from Don Colwell, Research Director, Apex Smelting and Refining Co., 6700 Grant Avenue, Cleveland.—Ed.

Communications

Sir:

We would appreciate tear sheets of the three articles on "Communications" which appeared in your May 12, 19, and 26, 1955 issues. *J. A. Kearney, Chief Metallurgist, Spaulding Works, Crucible Steel Company of America, Harrison, N. J.*

"100 Years"

Sir:

I want to express my congratulations to you on this issue. It is one of the finest publishing jobs that I have ever seen and I am getting quite a thrill out of going through it and picking up some of the old and new methods which have been employed in the metalworking field for the past number of years. *E. N. Adams, Advertising Manager, Cambridge Wire Cloth Company, Cambridge, Md.*

No one who hasn't worked on getting out such an issue knows what a whale of a job it is. This issue undoubtedly will be used as a textbook of metallurgical progress in the United States for many decades to come. *C. E. Wright, 1727 San Marco Blvd., Jacksonville, Fla.*

I shall treasure this volume and wish to thank THE IRON AGE for doing such a tremendous job for all the metal working industries. *V. A. Crosby, District Manager, Climax Molybdenum Co., 624 Fisher Bldg., Detroit.*

8 tons of power!

for . . .
Bending
Curling
Box Forming
Corrugating
Punching
Blanking
Hemming
Flattening

NEW DI-ACRO* PRESS BRAKE

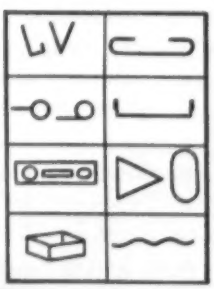
Eliminate tie-up of a large press brake on short-run production jobs with the new Di-Acro Press Brake. It's quickly set up for experimental engineering, too. Hand operated—ample power is provided for average use by a simple cam lever mechanism, plus a power multiplying ratchet drive for heavy forming jobs.

New Di-Acro Press Brake forms 16 gauge mild sheet steel across the full 24" forming width, 10 gauge mild sheet steel across a 12" width as well as other ductile materials. Available with standard dies and specials—both are interchangeable with other press brakes.

Write for free Press Brake literature

Send for 32 page catalog . . . contains complete information on Di-Acro hand and power operated Benders, Brakes, Notchers, Punch Presses, Rod Parters, Rollers, Shears, Spring Winders.

Diagrams below illustrate typical operations with a Di-Acro Press Brake and its remarkable versatility.



di-acro PRECISION METALWORKING MACHINES

*Pronounced Die-ack-ro

O'NEIL-IRWIN MFG. CO.
302 8th Ave.
LAKE CITY, MINN.

Gold mine refuse + World's greatest tank lining job = Uranium

URANIUM now is being recovered from the yellow mountains of slimes residue surrounding the gold mines on the Rand in South Africa. The process involves treatment of the abrasive, spent ore with sulfuric acid. No small problem was the protection of the many tanks, pumps and miles of piping from the twin attack of acid and abrasion. The answer was the world's largest sheet-rubber tank lining job.

A vital role in solving the many problems created by the sheer size and remoteness of the installations, plus subtropical heat and rains, was played by the G.T.M.—Goodyear Technical Man. Most important was his specification of PLIOWELD — especially compounded, acid- and abrasion-resistant rubber—and a *chemically curing* field procedure that eliminated sectionalized tanks or filling the tanks with hot water to vulcanize the rubber to the metal.

Over *six and one-half acres* of PLIOWELD have been used to protect equipment in this operation to date. Ultimately, some 1,250,000 square feet of tank surfaces, 50,000 feet of pipe and 1,000 pumps will be armored with rubber. How can PLIOWELD help you in your fight against corrosion? For details, see the G.T.M. or write: Goodyear, Industrial Products Division, Akron 16, Ohio.

Plioweld—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

PLIOWELD Tank Linings by

GOODYEAR

THE GREATEST NAME IN RUBBER

fatigue cracks

by William M. Coffey

We're Moving

After September 15, after you receive this issue, please do not address your editorial or advertising inquiries to our present New York address. There's a very good reason for this. There won't be anybody* here from those two departments to read them and they'll start piling up on our desk and that would be fatal because our desk even now resembles the New York City dump and on foggy days a city barge pulls alongside, loads the stuff aboard and dumps it far out to sea.

Instead, kindly address all editorial and advertising correspondence to THE IRON AGE, Chestnut & 56th Streets, Philadelphia 39, Pa., where is located the newly modernized and expanded offices and printing plant of the Chilton Co. of which we are part, the aforementioned company being the second largest industrial and business magazine publisher in America and we imagine the world, and the proud parent of your ffj. (If this sentence was too long, don't read some of it).

Please, however, continue to address all subscription questions (why-bill-me-when-I've-already-paid, it-didn't-arrive-on-time, enter-our-order-for-367-more-subscriptions type of thing) to our present New York address until sometime around the middle of October, we think.

We're all quite thrilled about this move. We're moving into splendid new quarters and aside from the inevitable personal adjustments that must happen (only the footings are completed in our new house and that's uncomfortable) we're happy and you should be, too, because our efficiency should go way up because we'll be sitting right where the presses and the money are kept and the little problems that irritate publishing people can now be solved on a face to face basis and not through the mediums of messengers and Mr. Bell.

We're going to print, right here in this column in this very magazine, a picture of our new diggings just as soon as the dust clears, and then you will understand why we're happy.

*This is a little exaggerated because we will still maintain at our New York address a branch office just as we do in Detroit, Chicago, et cetera, (ibid).

More Bound Volumes

We've already arranged to ship one set of bound volumes of back issues of your ffj, but still have another available. They run from 1918 through 1945, with a few missing. Close to half a ton of high class reference material for the first company or library that would like to have them for the cost of the freight.

Puzzlers

Goin' to ball game . . .

YANKEES

vs

ATHLETICS

game starts at 2:00 pm

it's now 1:30 pm

(no time to write puzzlers)

P.S. Boss is away

X—our mark

P.P.S. Also have telegram from boss saying, "Do what you consider necessary under circumstances to operate efficiently."

Whatever your particular cutting operations, there are Victor Hand and Power Hacksaws, Metal and Wood Cutting Band Saws and Hacksaw Frames to meet your specific requirements.

Every Victor distributor can give you prompt delivery of any metal cutting saw you want. His men are backed up by Victor factory experts who can show you the way to new speed and economy on production metal sawing operations.

Remember, no blade on the market will cut faster or last longer than the right Victor Blade – at the price you want!

And for top performance at a low price, use Victor "Moly"® High Speed Steel blades. Victor developed this high speed, heavily-alloyed steel blade of molybdenum. Remember, "Moly" High Speed blades outlast standard steel blades 10 to 1, cut as well as the *best* high speed steel blades made, but are substantially lower in cost.

Free!

Ask your Industrial Distributor for a supply of our NEW Metal Cutting Booklets and Wall Charts.

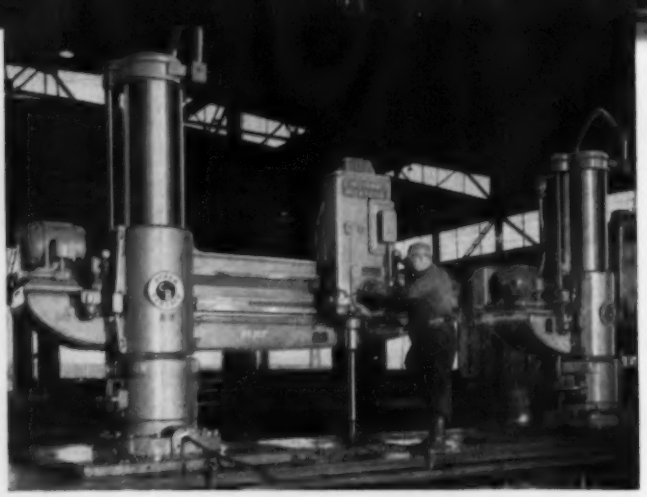
Sold Only Through Recognized Distributors

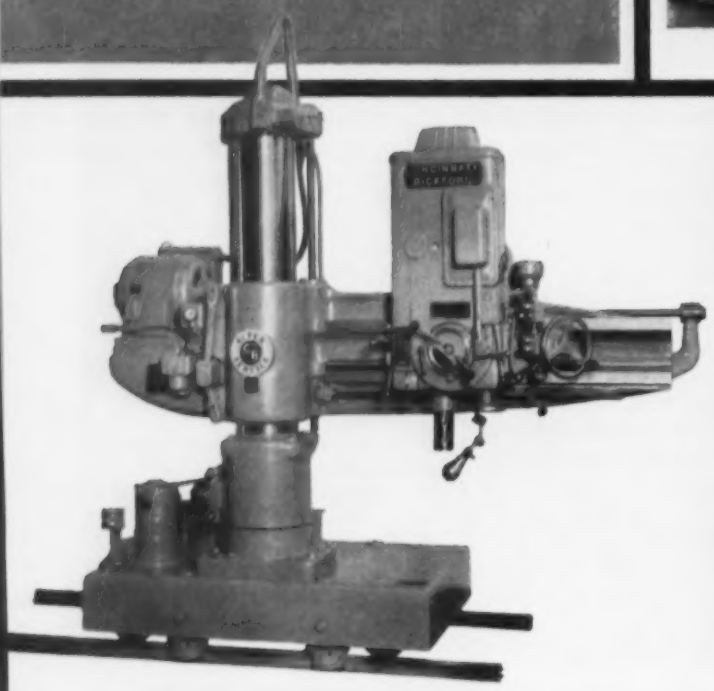
VICTOR ® 1955

SAW WORKS, INC., MIDDLETOWN, N.Y., U.S.A.

MAKERS OF HAND AND POWER HACKSAW BLADES, FRAMES, AND METAL AND WOOD CUTTING BAND SAW BLADES

MOVES that save you money



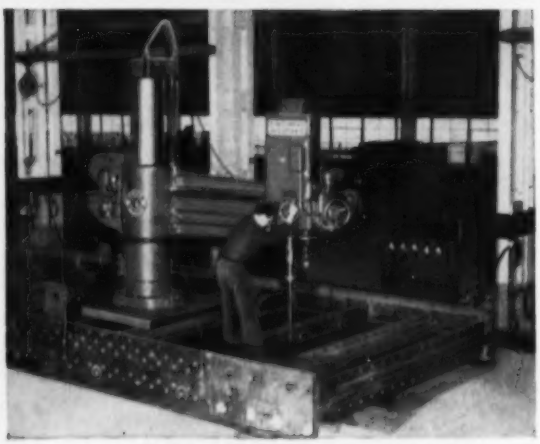


...on the large job!

These portable Cincinnati Bickford Super Service Radial Drills are effecting very large savings, up to 75% on work shown here. It is faster, more accurate and costs less to move the machine, instead of moving the work. Equipped with lifting bail, these machines are so perfectly proportioned and balanced that they need no clamping to work or floor. They do not tip or rise up while drilling.

Inquire about these portable machines—track type, sliding saddle on bed, or merely with stub base and lifting bail—they can save time and dollars for you.

Write for Bulletin R-29.



CINCINNATI BICKFORD

RADIAL AND UPRIGHT DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO.

Cincinnati 9, Ohio, U.S.A.

dates to remember

SEPTEMBER

PACKAGING MACHINERY MANUFACTURERS INSTITUTE—Annual meeting, Sept. 15-18, The Homestead, Hot Springs, Va. Institute headquarters are at 342 Madison Avenue, New York.

SOCIETY OF INDUSTRIAL PACKAGING & MATERIALS HANDLING ENGINEERS—Annual meeting, September 19-22, Kings Armory, New York. Society headquarters are at 111 West Jackson Blvd., Chicago.

EXPOSITIONS

Chicago, Sept. 6-17.
MACHINE TOOL SHOW — International Amphitheatre.

PRODUCTION ENGINEERING SHOW—Navy Pier.

COLISEUM MACHINERY SHOW — The Coliseum.

OCTOBER

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Fall general meeting, October 11-15, Morrison Hotel, Chicago. Institute headquarters are at 36 W. 46th St., New York City.

FOUNDRY EQUIPMENT MANUFACTURERS ASSN. — Annual meeting, October 13-15, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters are at 1008 Engineers Bldg., Cleveland.

CONVEYOR EQUIPMENT MANUFACTURERS ASSN. — Annual meeting, October 15-18, The Grieenbrier, White Sulphur Springs, W. Va. Association headquarters are at No. 1 Thomas Circle, Washington, D. C.

EXPOSITIONS

Philadelphia, October 17-21.
NATIONAL METAL CONGRESS AND EXPOSITION.

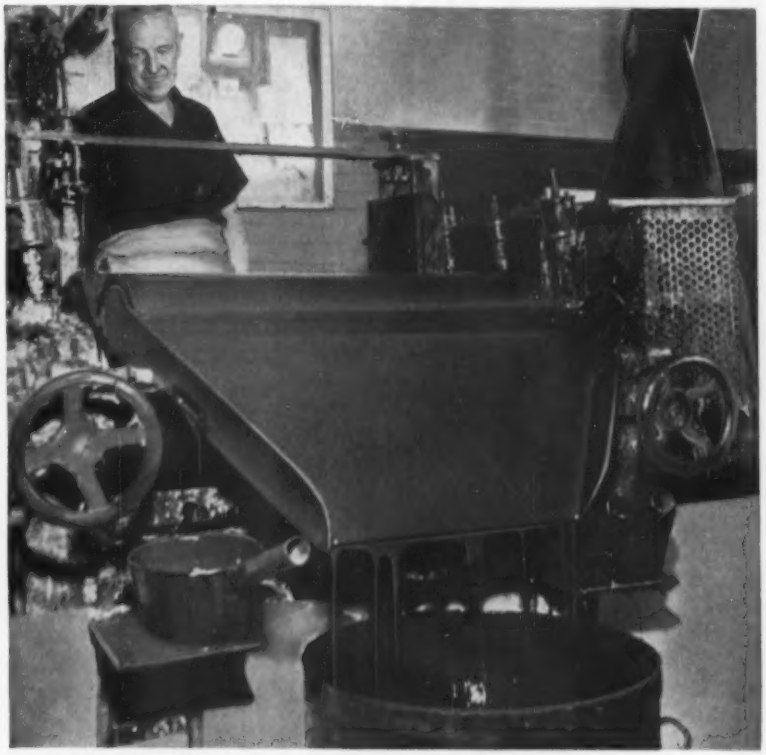
AMERICAN COKE & COAL CHEMICALS INSTITUTE—Annual meeting, October 17-18, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters are at 711 Fourteenth St., N. W., Washington, D. C.

AMERICAN GAS ASSN.—Annual convention, October 17-19, Los Angeles. Association headquarters are at 420 Lexington Ave., New York City.

AMERICAN INSTITUTE OF MINING & METALLURGICAL ENGINEERS—Annual fall meeting, Institute Metals Div., Oct. 17-19, Adelphia Hotel, Philadelphia. Institute headquarters are at 29 W. 39th St., New York City.

AMERICAN WELDING SOCIETY—National fall meeting, October 17-21, Philadelphia. Society headquarters are at 33 West 39th St., New York City.

FIRE HAZARD FOILED!



VINYL RESIN PLASTICIZERS AND VOLATILE SOLVENTS

Wherever highly combustible materials are used – as in this "dope room" at the Athol Manufacturing Company's Massachusetts plant, a potential fire hazard is *always* present!

Athol executives were keenly aware of the importance of *dependable, automatic* fire protection to provide the maximum in safety measures. So Athol called on Kidde – leaders in the field of fire extinguishing equipment.

Kidde engineers analyzed the various hazards, installed a 20-cylinder CO_2 extinguishing system which would automatically snuff out fire the instant it showed itself. In addition, pressure-operated trips were incorporated in the system to shut doors and windows, shut off fans and motors and to sound an alarm.

See to it that every fire hazard in *your* plant – machinery, flammable liquids, electrical equipment – gets the *best* in fire protection. Contact Kidde today!

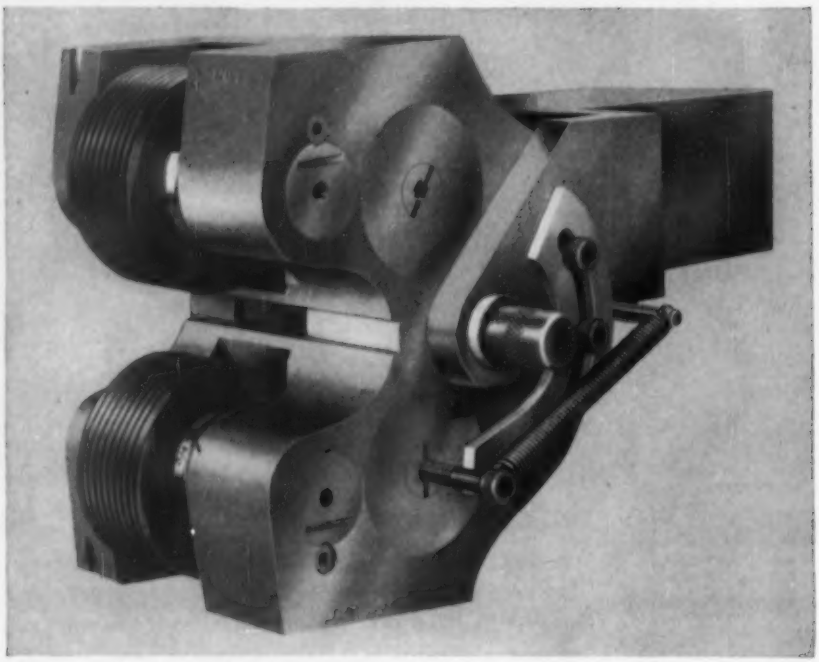
Kidde

Walter Kidde & Company, Inc.
949 Main Street, Belleville 9, N. J.

Walter Kidde & Company of Canada, Ltd., Montreal—Toronto

The words 'Kidde', 'Lux', 'Lux-O-Matic', 'Fyre-Frost' and the Kidde seal are trademarks of Walter Kidde & Company, Inc.

Coarse Pitch Threads Rolled to Class 4 Fit..



The LANROLL Thread Rolling Attachments offer features designed to ensure greater accuracy, flexibility and economy when producing threads. . . .

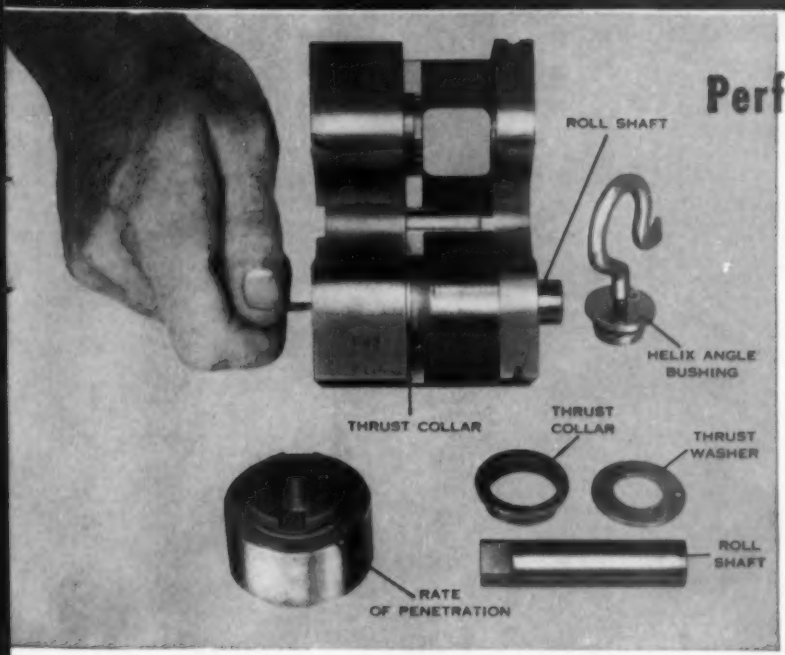
1. *PERFECT HELIX AGREEMENT* allows rolling coarse pitch threads to Class 4 tolerances with long roll life. Threads can also be rolled directly to a shoulder with safety.
2. *ADJUSTABLE DESIGN* provides wide range coverage for each attachment size without loss of rigidity.
3. *SUITABLE SIZES* of LANROLL Attachments have been designed for all types and sizes of automatic screw machines and turret lathes with power feed.
4. *RAPID AND PRECISE SET-UPS* are possible with special gaging methods designed for easy use and the elimination of "cut-and-try" set-ups.
5. Five sizes of Attachments roll a wide range of threads:
   #14—#5 to ⅜"; #18—#5 to ½"; #20—⅜" to 1"
   #22—⅝" to 1¼"; #24—¾" to 1¾"

Other outstanding advantages of these LANROLL Attachments include: behind-the-shoulder threading; taper correction; and excellent thread finish and microstructure. For additional information ask for Bulletin G-96—please send specifications when writing.

LANDIS *Machine* COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

423-c

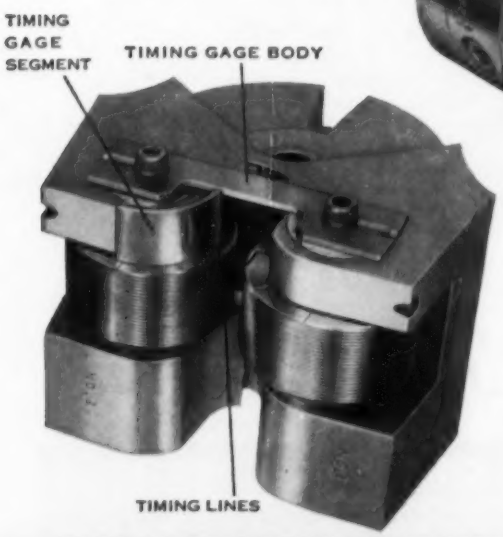


Perfect Helix Agreement

The helix angle bushings, thrust collars, and thrust washers provide a corrective between the workpiece and roll helixes, eliminating drunkenness and ensuring coarse pitch threads to Class 4 fit. All helix angle equipment is designed and marked for rapid changes.

Infinite Size Adjustment

Size adjustment links are used for major adjustments, with final sizing controlled by size adjusting screws. This system, and changing helix angle bushings, assures rolling all threads as though the attachment were exclusively engineered for that particular work.



Precise Timing

A simplified system of roll timing ensures satisfactory rolling on the first operation. Only one gage is used for timing all threads rolled by each attachment. Rolls are correctly timed when roll lines coincide with the vertical of the curved timing gage segment (illustrated).

This steel helps a hammer keep its head

It's an Estwing* solid steel unbreakable hammer. Made in one piece. Made of Youngstown high carbon manganese steel.

This steel must be strong and tough. It must possess the necessary qualities for forging, hardening and tempering. Because Youngstown has been furnishing it to accurate specifications for the last 14 years, Estwing's forging and heat treating operations have been fast and accurate.

Result: Costly rejections have been eliminated.
Employees find it easier to work.
Consumers get the world's only one-piece hammer.

By furnishing steel with the exact analysis, Youngstown has helped Estwing to effect substantial savings. Perhaps we can do the same for you. All it takes to find out is a phone call to any one of Youngstown's 28 district sales offices. Why not do it—today? It may save you a lot—tomorrow.

*Manufactured by Estwing Mfg. Co., Rockford, Ill.

Youngstown QUALITY STEEL

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

INDEX

CELLOPHANE TAPES
See examples 5, 27, 28, 29, 33.

PLASTIC TAPES
See examples 6, 12, 13, 15, 19.

FILAMENT TAPES
See examples 30, 38, 39, 40, 41, 42, 43, 44.

DOUBLE-COATED TAPES
See examples 3, 14, 17, 18.

ACETATE FIBRE TAPES
See examples 21, 29, 32, 33.

MASKING TAPES
See examples 1, 2, 4, 7, 8, 9, 10, 11, 16, 20, 22, 23, 24, 25, 26, 29, 31, 36, 37.

How metalworking plants

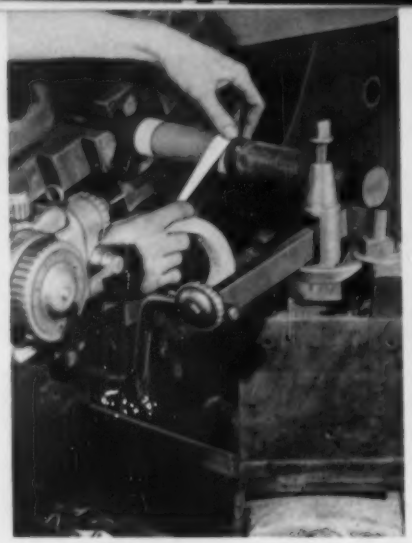
Save time...cut costs with

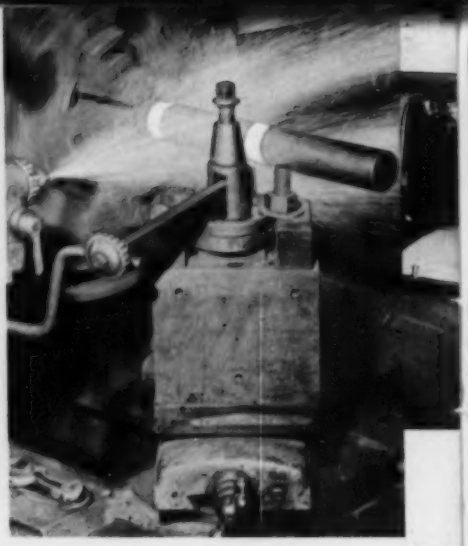
SCOTCH BRAND *Pressure-Sensitive Tapes*

45 ACTUAL EXAMPLES showing how production is increased . . . costs are cut . . . products are improved with "SCOTCH" Brand Pressure-Sensitive Tapes.

MACHINING is easier when you mask, hold, protect with TAPES...

Versatile, *practical*, and easy-to-use "SCOTCH" Brand Pressure-Sensitive Tapes can hold work too small for clamping or made of non-magnetic materials . . . can protect finished surfaces during further processing . . . can mask . . . bind . . . join—in fact, save time, material, and labor in just about every machining operation you may have.





1 MINIMIZE the machining and refinishing time needed after metalizing by using "SCOTCH" Brand Super-Strength Masking Tape No. 300. This tough, heat-resistant tape forms a protective barrier over surface where build-up from molten-metal spray is **not** desired. Tape is easy to apply; easy to remove after use.

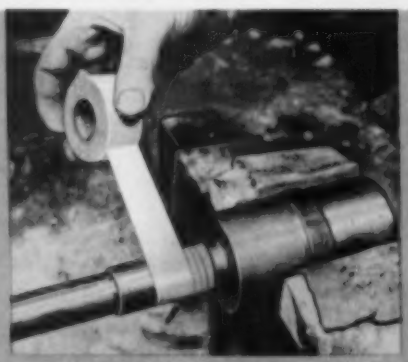
2 SPEED weld-smoothing by masking both sides of seam with "SCOTCH" Brand Extra-Strength Masking Tape No. 280. Bead is then ground and buffed to leave a definite smooth finished strip.

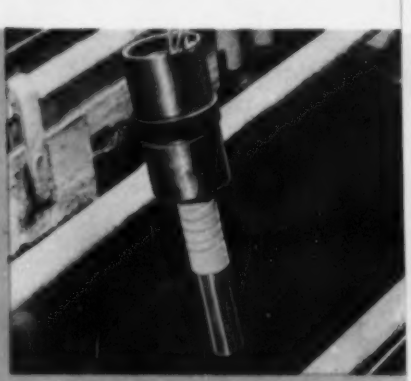
3 HOLD parts on milling bed with "SCOTCH" Brand Double-Coated Tape No. 400. Adhesive on tape surface holds parts securely; eliminates time-consuming clamp or fastener set-ups.

4 POSITION balancing rods prior to installation with "SCOTCH" Brand Masking Tape No. 202. Tape holds firmly; yet rods can be adjusted easily.

5 SECURE small machine parts to job tickets or blueprints with "SCOTCH" Brand Cellophane Tape No. 600. Transparent backing allows immediate identification of part; does not obscure printing.

Save time... do better ELECTROPLATING





6 ALL PLATING operations gain economy by using "SCOTCH" Brand Pressure-Sensitive Tapes for selective masking and rack-wrapping. Above, for instance, you see "SCOTCH" Brand Plastic Tape No. 470 used on part prior to and during chrome-plating. Tape's strong, conformable backing and tight-holding adhesive resist the effects of the bath; eliminate any "creeping under" action.

There are more than 300 PRESSURE-SENSITIVE TAPES

STAMPING and FABRICATING can profitably use these TAPE "Tools"

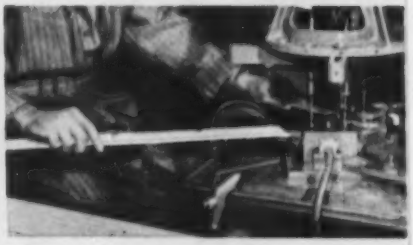
Polished surfaces often need protection through stamping, blanking, or fabricating. "SCOTCH" Brand Tapes can protect three ways: 1. By covering the entire area; 2. by lining female dies; 3. by holding protective masking material in place. Regardless of which method you use, tape can protect your products against marring and scratching in production.

7 **PROTECT** aluminum strips during drilling and boring operations with "SCOTCH" Brand Masking Tape No. 250. Above applicator was custom designed by "3M" to apply tape to strips automatically at production speeds.

8 **HOLD** components temporarily together during stamping operations with "SCOTCH" Brand Masking Tape No. 216. Tape adhesive will not transfer; strips off clean after final assembly.

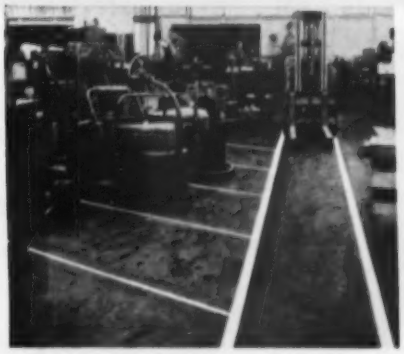
9 **SPEED** application of coverings with "SCOTCH" Masking Tape, paper, and "SCOTCH" Apron Taper. Tape is automatically applied to one or both edges of paper as it is unrolled.

10 **REDUCE** damage to polished surfaces by masking with "SCOTCH" Brand Tape No. 202 and paper. Faster stamping, too; no special precautions for scratches or stains needed.

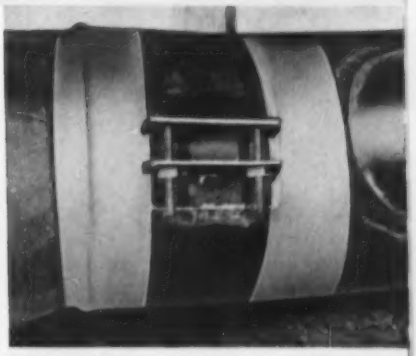


11 **CUT** number of rejects caused in processing aluminum by protecting with "SCOTCH" Masking Tape No. 250. Tape resists scratching and abrasion; strips off clean.

Easy answers to plant MAINTENANCE problems



12 **MARK LANES** for traffic; define storage areas with "SCOTCH" Plastic Tape No. 471. Tape sticks to any clean, dry surface; resists acids, alkalies, oils, and solvents. Eight colors.



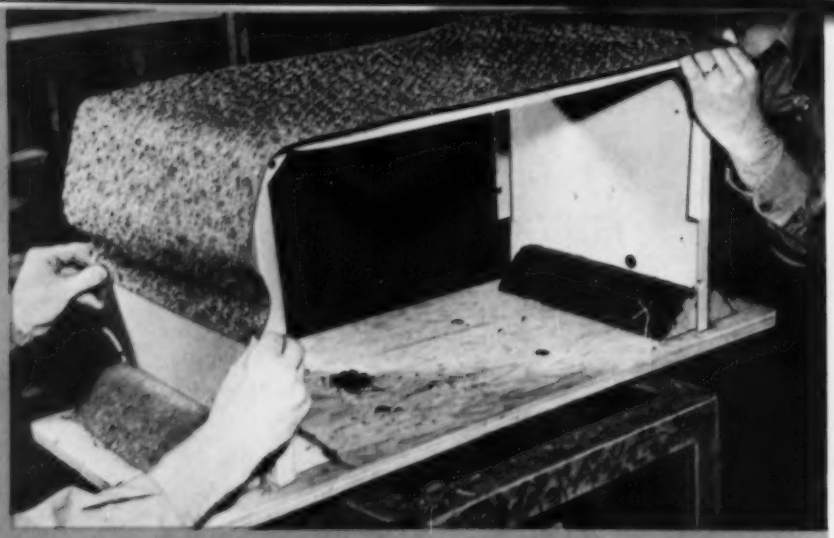
13 **SEAL** duct joints air-tight with "SCOTCH" Brand Plastic Tape No. 474. Tough, stretchy tape conforms easily to irregular or curved surfaces; is unaffected by heat, moisture.

for industry trademarked SCOTCH BRAND

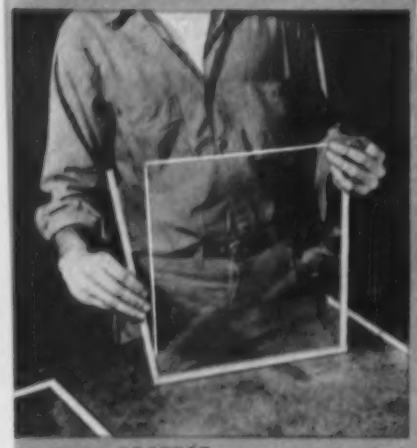
Reg. U.S. Pat. Off.

PRODUCT ASSEMBLY
is simplified with Pressure-Sensitive **TAPES**

You can get "SCOTCH" Brand Pressure-Sensitive Tapes made of foil or cloth, as strong as steel, as flexible as fine paper, waterproof, acid resistant, even sticky on both sides. In other words, whatever your problem in assembling a product, there is a tape to do it faster, cheaper, cleaner, better!

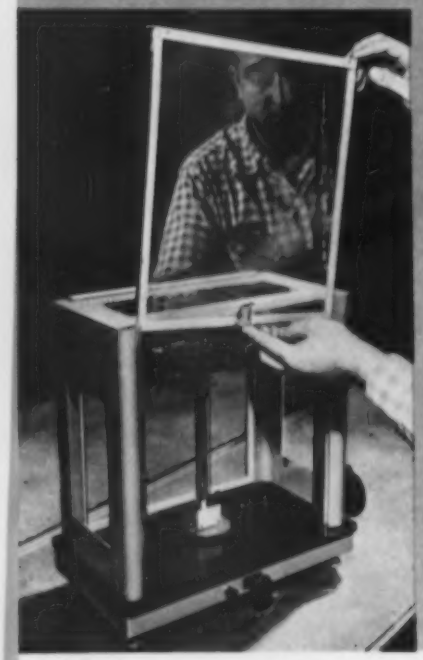


14 **HOLD** decorative cloth coverings on consumer equipment with "SCOTCH" Brand Double-Coated Tape No. 400 applied to edges and corners of the wood or metal frame. Tape sticks at a touch; is clean and easy to handle; assures a long-lasting bond with outstanding application economy.

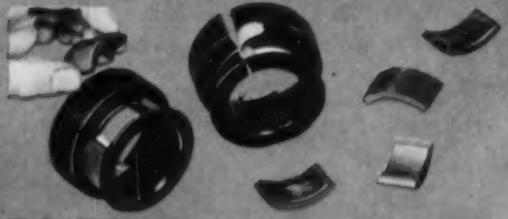


15 **PROTECT** glass panels with "SCOTCH" Brand Plastic Tape No. 471. Top: Metal channels fitted to taped glass edges. Bottom: Vibration-proofed assembly is inserted into case.

16 **POSITION** small parts temporarily with "SCOTCH" Brand Masking Tape No. 202. Above, vibration shims are taped to automobile frames to hold them until body is bolted down. Tape is economical; easy to apply; easy to dispose of.



17 **SPEED** assembling with "SCOTCH" Double-Coated Tape No. 666 and M-71 Dispenser.



18 **TWO JOBS** are often handled by "SCOTCH" Double-Coated Tape. At right, tape holds halves of part; left, same strip temporarily positions graphite blocks.

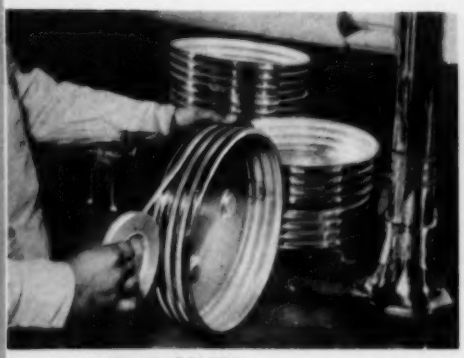
19 **DECORATE** products with "SCOTCH" Brand Metalized Polyester Tape No. 850. Withstands extreme temperatures and exposure; will not tarnish.

There are more than 300 PRESSURE-SENSITIVE

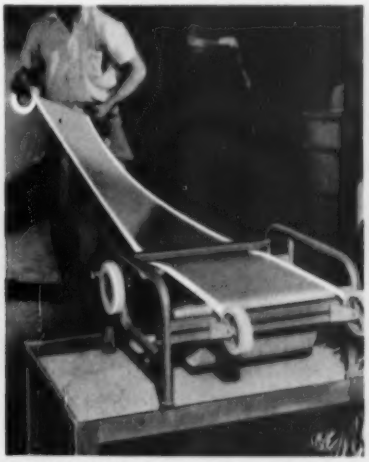
PAINTING
is neater, cleaner, quicker with TAPE!

The variety of "SCOTCH" Brand Masking Tapes is constantly being expanded to meet new needs of industry as fast as they arise. Advancements in dispensing tape make it possible to do many jobs automatically. All in all, "SCOTCH" Brand Masking Tapes can save time and money wherever painting is done in your plant.

20 **SELECTIVE** masking of auto bodies for multi-tone painting is easily accomplished with "SCOTCH" Brand Masking Tapes. Tapes stick at a touch; hold firmly to prevent paint "bleeding" or "creep-under"; withstand drying temperatures up to 280° for extended periods; strip off easily; leave no adhesive residue.



21 **COLORS** that roll on dry! Fountain stools are trimmed with economical, long-life, **red** "SCOTCH" Brand Acetate Fibre Tape No. 700.



22 **SPEED** large-area masking with "SCOTCH" Brand Apron Taper. Dispenses paper strip with masking tape already applied to edge.

23 **SAVE** time and materials on intricate masking jobs with pre-cut pieces of "SCOTCH" Brand Masking Tape. May be cut on the job.

24 **FOR HIGH-HEAT** bake-oven applications, use "SCOTCH" Brand High-Heat Masking Tapes. Withstand temperatures to 375° F.

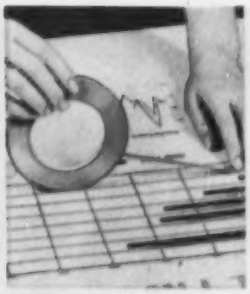
25 **FLEXIBLE** creped backing of "SCOTCH" Brand Masking Tape. No. 202 takes curves and irregular surfaces easily.

OFFICES too need good TAPE "TOOLS"!

"SCOTCH" Brand Tapes can protect and preserve records, blueprints, documents; provide colors for charts; hold, seal, bind; securely seal envelopes and cartons in a matter of seconds.

26 **SEAL** envelopes, boxes, packages neatly and securely with "SCOTCH" Carton Sealing Tape No. 260. Easy-to-apply tape sticks at a touch; is tough, weather-resistant and long aging.

27 **ANCHOR** riders, attachments, etc. to original documents with "SCOTCH" Brand Cellophane Tape. Crystal-clear tape does not obscure printing; holds pieces securely together.



28 **CHARTS** and graphs are easy to make with "SCOTCH" Brand Tapes in **colors.** 12 brilliant colors roll on dry . . . stick at a touch . . . no smearing or clean-up time.

TAPES for industry trademarked SCOTCH BRAND . . . . . .

Reg. U.S. Pat. Off.

You name it...
We'll **TAPE** *it...*

- *Manually*
- *Semi-Automatically*
- *Fully Automatically!*

45 Nearly every tape applying operation can be performed better, faster and cheaper with a dispenser designed for the job. There are now more than 75 different types of manual, automatic, and semi-automatic dispensers available for "SCOTCH" Brand Tapes. And these basic types of machines lend themselves to an infinite variety of adaptations. Chances are, whatever your taping problems, our Customer Service Department already has a dispenser answer. If not, they'll be glad to work one out for you without cost or obligation.

Get "Scotch" Brand Pressure-Sensitive Tapes from your regular distributor or use this inquiry form for complete information

NEW INQUIRY
RUSH
INFORMATION!

MINNESOTA MINING AND MFG. CO.
St. Paul 6, Minnesota

Please send me complete information on the metalworking tapes and applications checked:

TAPES: ☐ CELLOPHANE ☐ PLASTIC ☐ FILAMENT ☐ DOUBLE-COATED ☐ ACETATE FIBRE ☐ MASKING

☐ 1 METALIZING	☐ 12 LANE MARKING	☐ 23 PRE-CUT MASKS	☐ 34 WELDING
☐ 2 WELD SMOOTHING	☐ 13 SEALING DUCTS	☐ 24 HIGH-HEAT MASKING	☐ 35 GLASS CLOTH
☐ 3 MILLING	☐ 14 CLOTH COVERINGS	☐ 25 PROTECTIVE MASKING	☐ 36 PROTECT METAL
☐ 4 POSITIONING	☐ 15 GLASS CUSHIONING	☐ 26 SEALING	☐ 37 METAL COILS
☐ 5 SMALL PARTS	☐ 16 TEMPORARY HOLDING	☐ 27 ANCHORING	☐ 38 STAIN RESISTANT
☐ 6 ELECTROPLATING	☐ 17 ASSEMBLING	☐ 28 CHARTS	☐ 39 BUNDLING
☐ 7 ALUMINUM	☐ 18 TWO-JOB TAPE	☐ 29 PROMOTION	☐ 40 AUTOMATIC
☐ 8 STAMPING	☐ 19 DECORATING	☐ 30 TEAR STRIP	☐ 41 COVERS
☐ 9 COVERINGS	☐ 20 SELECTIVE MASKING	☐ 31 SCREWS	☐ 42 PALLETIZING
☐ 10 STAMP MASKING	☐ 21 DRY COLORS	☐ 32 IDENTIFICATION	☐ 43 REINFORCING
☐ 11 SCRATCH PROTECTION	☐ 22 APRON TAPER	☐ 33 PRINTED TAPES	☐ 44 BULKY PACKAGES

☐ 45 DISPENSERS OTHER .....

There are more than... **300** PRESSURE-SENSITIVE TAPES for industry, trademarked...

NAME ..... TITLE .....

COMPANY ..... ADDRESS .....

CITY ..... ZONE .....

STATE .....

REG. U.S. PAT. OFF.
SCOTCH BRAND

The term "SCOTCH" and the plaid design are registered trademarks for the more than 300 pressure-sensitive tapes

MADE IN U.S.A. BY
MINNESOTA MINING AND MANUFACTURING COMPANY
ST. PAUL 6, MINNESOTA

General Export: 99 Park Ave., New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

PREVIEW ITS SPEED, ACCURACY AND VERSATILITY AT THE SHOW!

CAST IRON END PLATES

30 pieces (60 surfaces) per hour; ⅛" stock removed each side; limits ± .002"

ADJUSTING SCREW WASHERS

Low carbon steel; 200 pieces (200 surfaces) per hour; .025" stock removed; limits ± .001"

HOT ROLLED STEEL CAMS

225 pieces (450 surfaces) per hour; 1/32" stock removed each side; limits ± .001"

NOW! BLANCHARD PRESENTS ANOTHER GREAT NEW GRINDER *with Automatic Cycle Control*

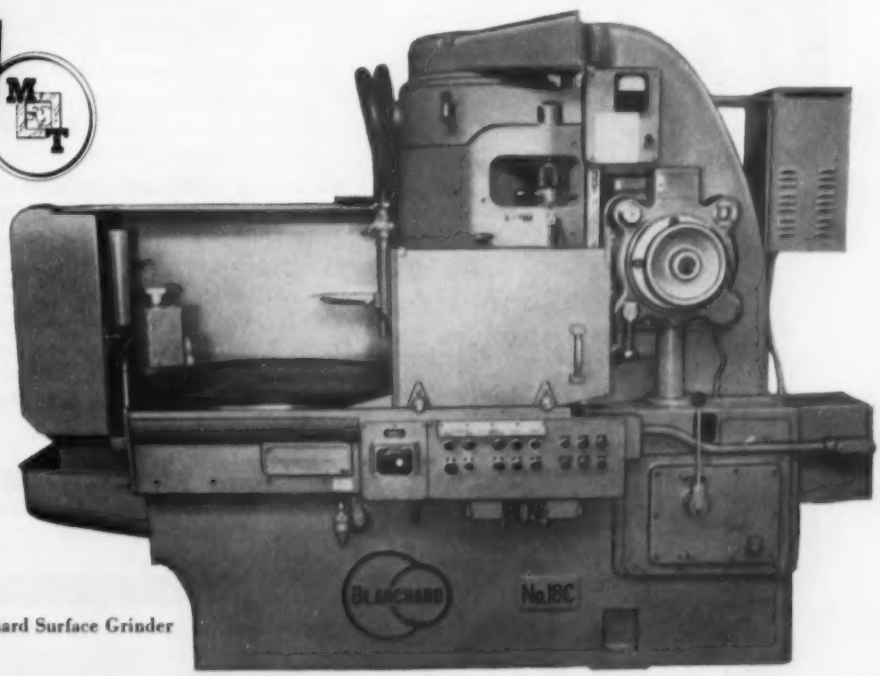
When you're at the show, watch this great new Blanchard Surface Grinder perform a variety of jobs with speed, ease and accuracy.

One operator can easily operate two of these No. 18-C grinders under balanced conditions. By using the automatic cycle, he can unload, clean and reload one grinder while the other is grinding.

Here's what the automatic cycle does: moves chuck (30" or 36" dia.) to grinding position and starts it rotating; starts wheel rotation and coolant pump; provides rapid wheel approach to work; engages power down-feed at preset rate; changes to fine feed just before finished size is reached; stops feed when work is to size – "sparks" out; raises wheel head; stops wheel, coolant pump and chuck; moves chuck to loading position – demagnetizes chuck.

This new Blanchard also features: push button selection of manual or cycle operation; size control; simplified feed and head traverse controls; adjustable dwell timer.

THE MACHINE TOOL SHOW
CHICAGO, ILL.
BOOTH 406

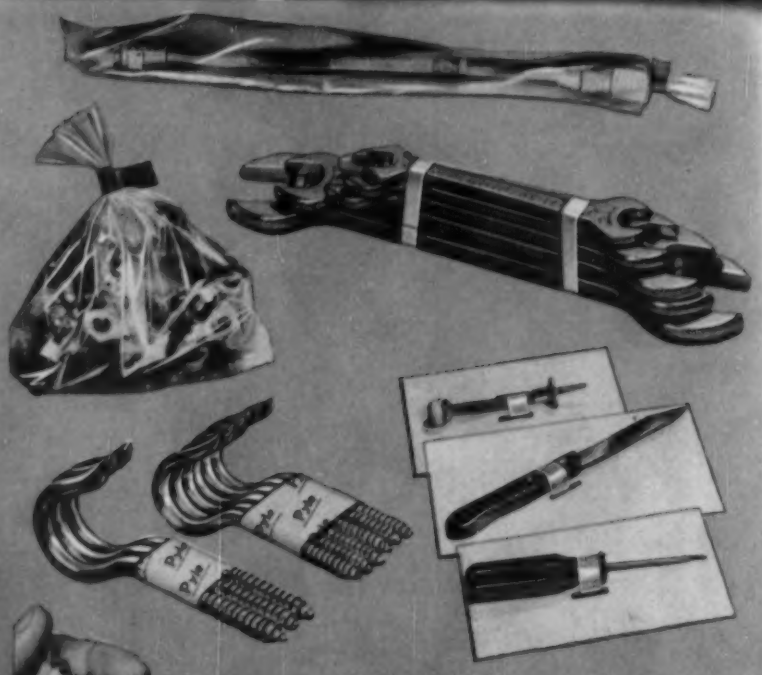


No. 18-C Blanchard Surface Grinder

THE BLANCHARD MACHINE COMPANY 64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.

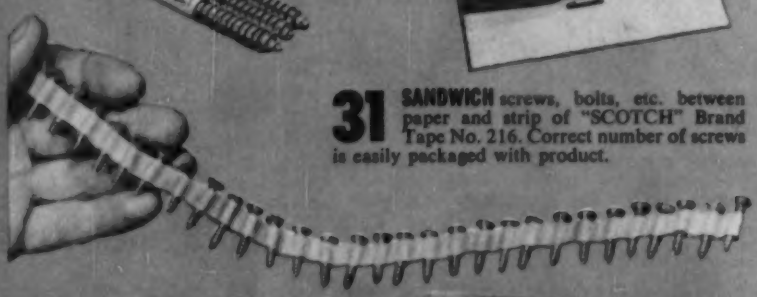
PROMOTE PRODUCTS with TAPES that sell as they hold

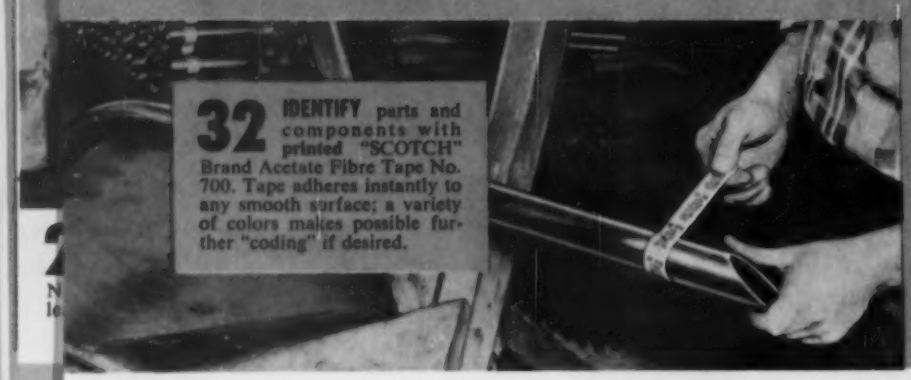
29 Versatile "SCOTCH" Brand Pressure-Sensitive Tapes contribute greatly to the sale and merchandising of metalworking products. The wide range of colors; the variety of backings; plus instant-grabbing adhesives make "SCOTCH" Brand Tapes ideal for product labeling, holding, sealing, and banding. "SCOTCH" Brand Tapes help you gain greater customer recognition and acceptance for your products!



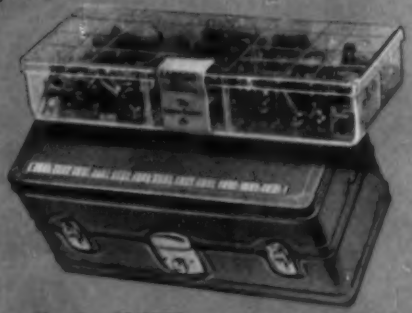
30 **TEAR STRIP CONTAINERS** open Z-I-P . . . with a pull of tape — "SCOTCH" Brand Filament Tape. No knives . . . no damaged product!

31 **SANDWICH** screws, bolts, etc. between paper and strip of "SCOTCH" Brand Tape No. 216. Correct number of screws is easily packaged with product.





32 **IDENTIFY** parts and components with printed "SCOTCH" Brand Acetate Fibre Tape No. 700. Tape adheres instantly to any smooth surface; a variety of colors makes possible further "coding" if desired.

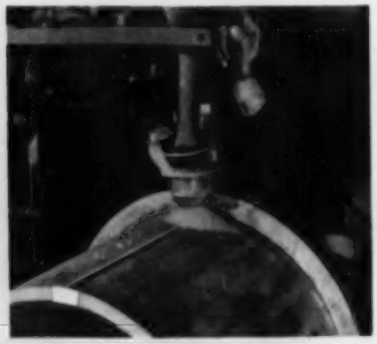


33 **PRINTED** tapes do many selling jobs: Top, Acetate Fibre Tape secures lid, promotes brand name; bottom, printed "SCOTCH" Brand Cellophane Tape ruler decorates tackle box.

WELDING is faster, easier with TAPE as a tool!

"SCOTCH" Brand Glass Cloth Tape No. 365 literally "pays for itself and shows a profit" in time savings when used on submerged arc welding operations:

34 **TAPE** is quickly applied on butt, double V, and fillet welds to prevent burn-outs on partial penetrations. Tape sticks at a touch.

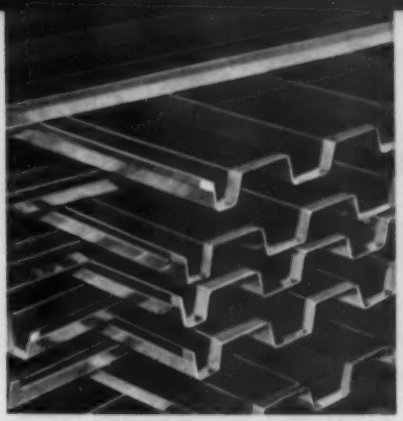


35 **WHEN** "SCOTCH" Brand Tape No. 365 is used as a replacement for stringer bead and other back-up materials, clean-up time is cut 75%.

. For further information on any tape application

PACKAGING and SHIPPING . . . expedite with TAPES

"SCOTCH" Brand Pressure-Sensitive Tapes provide an answer to almost every packaging and materials handling operation: holding, sealing, banding, reinforcing, bundling, palletizing, and securing. What's more, nearly all these operations can be performed with automatic or semi-automatic tape applying equipment to make packaging a production-line operation.



36 **PROTECT** polished metals during stamping, shipping, storage (one tape does all!) by covering with "SCOTCH" Brand Tape No. 344.

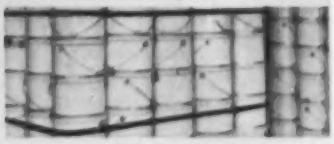
37 **TAB** metal coil ends on spool with "SCOTCH" Brand Masking Tape. Tape holds firmly; will not scratch or mar surface.

38 **STAIN-RESISTANT** . . . "SCOTCH" Brand Tape No. 885 can be used to bundle painted metal pieces for shipment without fear of binding, scratching, staining, or paint removal.

39 **BUNDLE** metal pipe, tubing, rods, bars, with "SCOTCH" Brand Filament Tape. Tape has up to 500 lbs. tensile strength per inch of tape width; exclusive "mirror-surface" adhesive puts it all to work.

40 **AUTOMATIC** equipment wraps three pipe or bar stock bundles a minute with "SCOTCH" Filament Tape.

41 **FASTEN** coverings on porcelain, enamel, or stainless steel; secure doors, drawers, with "SCOTCH" Brand Filament Tape.



42 **PALLETIZE** drums, cartons, etc. to prevent shifting or sliding with layer wraps of "SCOTCH" Brand Filament Tape.

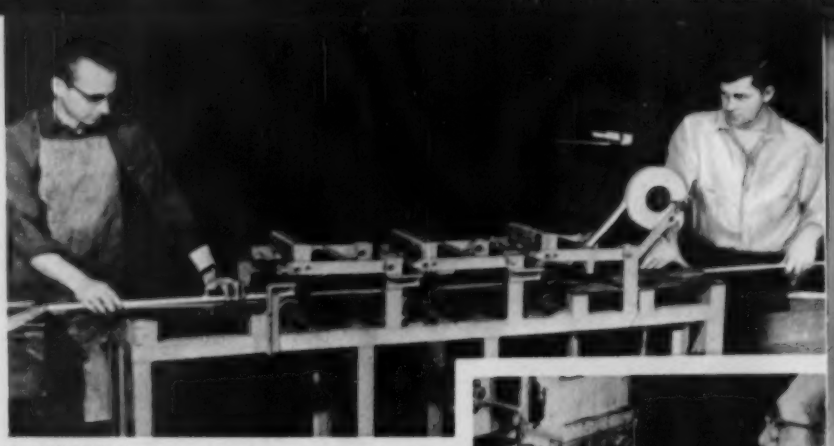
43 **SHORT STRIPS** of "SCOTCH" Brand Filament Tape reinforce cartons. Same tape that holds cartons closed, strengthens score lines.

44 **BULKY** bundles can be easily wrapped with "SCOTCH" Brand Filament Tape. Above: Automatic air-operated dispensers deliver pre-determined lengths of tape as automobile bumper is lowered into wrapping cradle. Workers simply pick tape from dispenser. Quick, easy wrapping at production line speeds.

ons, use inquiry form on last page

STAMPING and FABRICATING can profitably use these TAPE "Tools"

Polished surfaces often need protection through stamping, blanking, or fabricating. "SCOTCH" Brand Tapes can protect three ways: 1. By covering the entire area; 2. by lining female dies; 3. by holding protective masking material in place. Regardless of which method you use, tape can protect your products against marring and scratching in production.



7 **PROTECT** aluminum strips during drilling and boring operations with "SCOTCH" Brand Masking Tape No. 250. Above applicator was custom designed by "3M" to apply tape to strips automatically at production speeds.

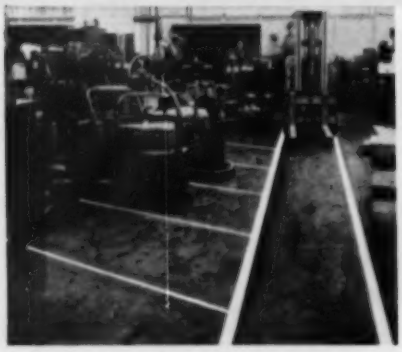
8 **HOLD** components temporarily together during stamping operations with "SCOTCH" Brand Masking Tape No. 216. Tape adhesive will not transfer; strips off clean after final assembly.

9 **SPEED** application of coverings with "SCOTCH" Masking Tape, paper, and "SCOTCH" Apron Taper. Tape is automatically applied to one or both edges of paper as it is unrolled.

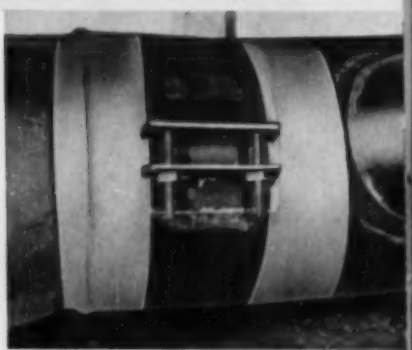
10 **REDUCE** damage to polished surfaces by masking with "SCOTCH" Brand Tape No. 202 and paper. Faster stamping, too; no special precautions for scratches or stains needed.

11 **CUT** number of rejects caused in processing aluminum by protecting with "SCOTCH" Masking Tape No. 250. Tape resists scratching and abrasion; strips off clean.

Easy answers to plant MAINTENANCE problems



12 **MARK LANES** for traffic; define storage areas with "SCOTCH" Plastic Tape No. 471. Tape sticks to any clean, dry surface; resists acids, alkalies, oils, and solvents. Eight colors.



13 **SEAL** duct joints air-tight with "SCOTCH" Brand Plastic Tape No. 474. Tough, stretchy tape conforms easily to irregular or curved surfaces; is unaffected by heat, moisture.

for industry trademarked SCOTCH BRAND

PREVIEW ITS SPEED, ACCURACY AND VERSATILITY AT THE SHOW!

CAST IRON END PLATES

30 pieces (60 surfaces) per hour; ⅛" stock removed each side; limits ± .002"

ADJUSTING SCREW WASHERS

Low carbon steel; 200 pieces (200 surfaces) per hour; .025" stock removed; limits ± .001"

HOT ROLLED STEEL CAMS

225 pieces (450 surfaces) per hour; 1/32" stock removed each side; limits ± .001"

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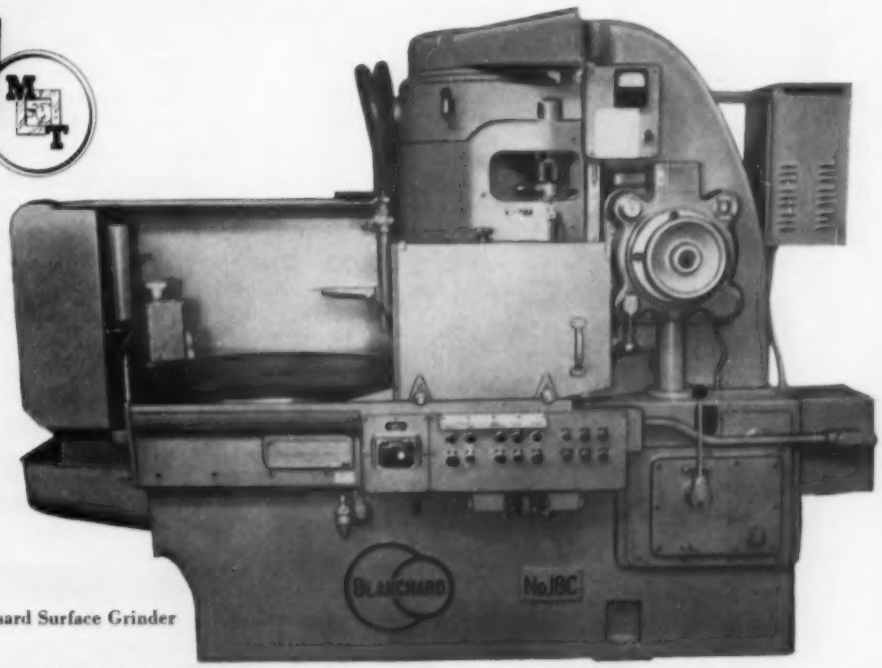
Here's what the automatic cycle does: moves chuck (30" or 36" dia.) to grinding position and starts it rotating; starts wheel rotation and coolant pump; provides rapid wheel approach to work; engages power down-feed at preset rate; changes to fine feed just before finished size is reached; stops feed when work is to size – "sparks" out; raises wheel head; stops wheel, coolant pump and chuck; moves chuck to loading position – demagnetizes chuck.

This new Blanchard also features: push button selection of manual or cycle operation; size control; simplified feed and head traverse controls; adjustable dwell timer.

THE MACHINE TOOL SHOW CHICAGO, ILL.

BOOTH 406



No. 18-C Blanchard Surface Grinder

THE BLANCHARD MACHINE COMPANY 64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.

1001 things now being done by

COLD-ROLL FORMING

As your production requirements grow, new opportunities for effecting economies are offered by cold roll forming components. A few applications are illustrated here: The structural parts of the new Giant 74-ton Boeing Stratofreighter KC-97G are, as in most other planes, made almost entirely from cold-roll-formed shapes because of their high strength-weight ratio.

In the modern warehouse shown at left, the steel decking and rolling steel doors were cold roll formed and installed by the R. C. Mahon Company, Detroit, Michigan.

In the photo of an Armstrong furnace below, the arrows point to the jacket rings and two pilasters framing the front openings—all cold roll formed at a big saving compared with previous methods.

The new Yoder book on Cold Roll Forming is an illustrated story of many of the things which are made lighter, stronger and more accurately by this process than by any other, yet at greatly reduced cost. It is also a complete textbook on the machines, their tooling, operation, and economic possibilities.

A copy is yours for the asking.

THE YODER COMPANY
5510 Walworth Avenue • Cleveland 2, Ohio

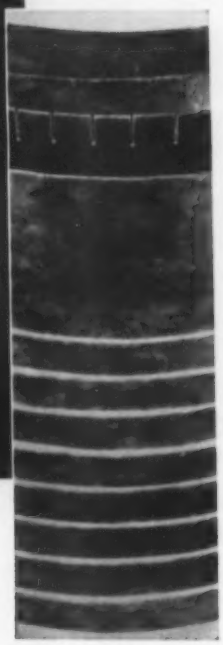
Complete Production Lines

- COLD-ROLL-FORMING and auxiliary machinery
- GANG SLITTING LINES for Coils and Sheets
- PIPE and TUBE MILLS—cold forming and welding

ENGINEERING YODER MANUFACTURING

How special insulation protects

DEEP-DOWN PULLING POWER



Stearns uses a special mica plate for insulation around the inside diameter of the coil and between the pancake coils. Mica is laminated and consists of about nine layers of 1/32 in. molding mica. This is applied under heat and provides a very dense and hard insulation between the copper and steel. Discs between coils are also made of laminated mica and finished under pressure.

• Protect the coil and you safeguard the very heart of a lifting magnet. That is why powerful, deep-field Stearns magnets are built with extra heavy-duty coil insulation, extra protection against shorts, burn-outs, current leakage.

With this insulation, a Stearns lifting magnet can withstand heat generated during steady work periods — operates profitably on long-shift duty. And it's added protection when magnet is working outdoors or under excessively damp conditions.

Superior insulation is only one of the ways Stearns keeps its powerful lifting magnets in top operating condition. See your Stearns representative for all the facts, or write for Bulletin 35-C. 1098

MAGNETIC EQUIPMENT FOR ALL INDUSTRY

STEARNS MAGNETS

STEARNS MAGNETIC, INC. 691 S. 28th St., Milwaukee 46, Wis.

4 Times the Life-Span of "Gray" Iron

Harnischfeger gets longer life and easier fabrication from Ductile Cast Iron

In solving a machining problem, Harnischfeger Corporation discovered how to greatly increase life of sheaves handling wire rope on their overhead cranes.

The problem arose in machining sheaves of gray cast iron. Chill at the top and corners of rope grooves caused cutting tool breakage.

When Harnischfeger annealed these castings to improve machinability, the base or bottom of the rope grooves were softened. Ranging from 140 to 196 BHN, the softened grooves wore out prematurely and frequent replacements were needed . . . wasting valuable hours of production time.

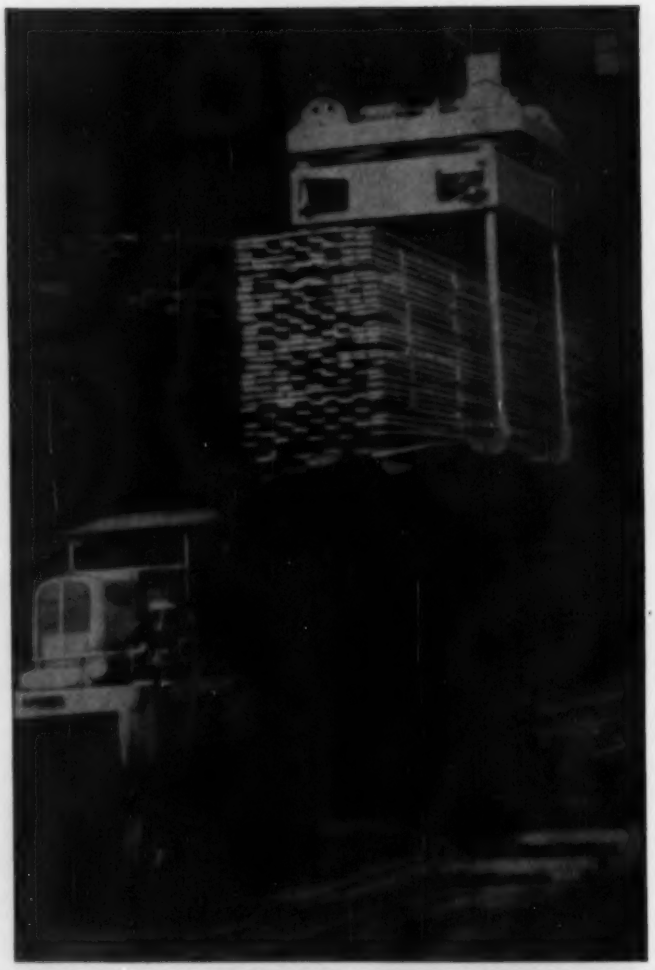
Ductile Cast Iron the answer

Ductile iron, which has excellent wear resistance, solved the problem.

Although the hardness of the Ductile Cast Iron was higher (240-269 BHN) than that of cast iron, it was free of chill at the edges and machined readily. But especially important in handling wire rope, the wear resistance provided by Ductile Cast Iron gave the sheaves a 4 to 1 longer life than gray iron.

This is a simple example, showing how you get multiple savings by using Ductile Cast Iron. For here's a material with the castability of cast iron, and properties similar to those of cast steel.

Get all the facts about the impact strength, wear resistance and machinability of this economical cast iron. It's several times stronger and tougher than gray cast iron. Send for a copy of "DUCTILE IRON, The Cast Iron THAT CAN BE BENT!" It's filled with helpful data. Write for your copy now.



Way to cut downtime of overhead traveling crane. Grapple shown at work in lumber shed is equipped with sheaves of Ductile Cast Iron. Readily machinable, but resistant to wear from wire rope, they outlast gray iron sheaves 4 to 1. Equipment produced by Harnischfeger Corp., Milwaukee 46, Wisc.

DUCTILE IRON

ductile iron . . . the cast iron that can be twisted and bent

THE INTERNATIONAL NICKEL COMPANY, INC. 67 Wall Street New York 5, N. Y.

DISSTON STAINLESS STEEL

...hot rolled to SHAPE

saves steel · tooling · machining

Stainless steel users receive many advantages by ordering Disston steel shapes accurately rolled to their specifications.

LESS MACHINING. Tool operations are simplified, for Disston shapes are rolled to precision tolerances, have exceptionally fine finishes.

REDUCTION IN WASTE MATERIAL. Preshaped Disston steel reduces scrap losses. One well-known manufacturer saved 47% of stainless steel tonnage by starting with a rolled Disston shape—instead of a rectangular section.

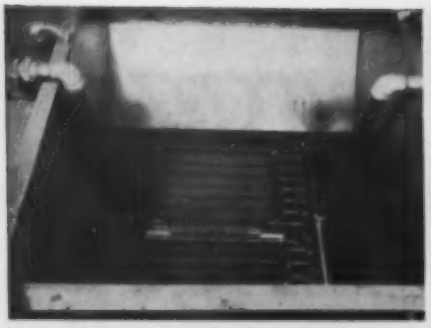
LOW-COST HANDLING OF SMALL ORDERS. Jobs as little as five or ten tons on a particular shape are rolled easily, economically in the Disston mills. Over 100 years of leadership in the rolling of special shapes gives Disston the edge in metal-shaping skill and technique.

Why not talk over your requirements with a Disston representative? Learn how much you can save by using Disston stainless steel shapes. Or write to:

Henry Disston & Sons, Inc., Steel Sales Division
919 Tacony, Philadelphia 35, Pa., U. S. A.

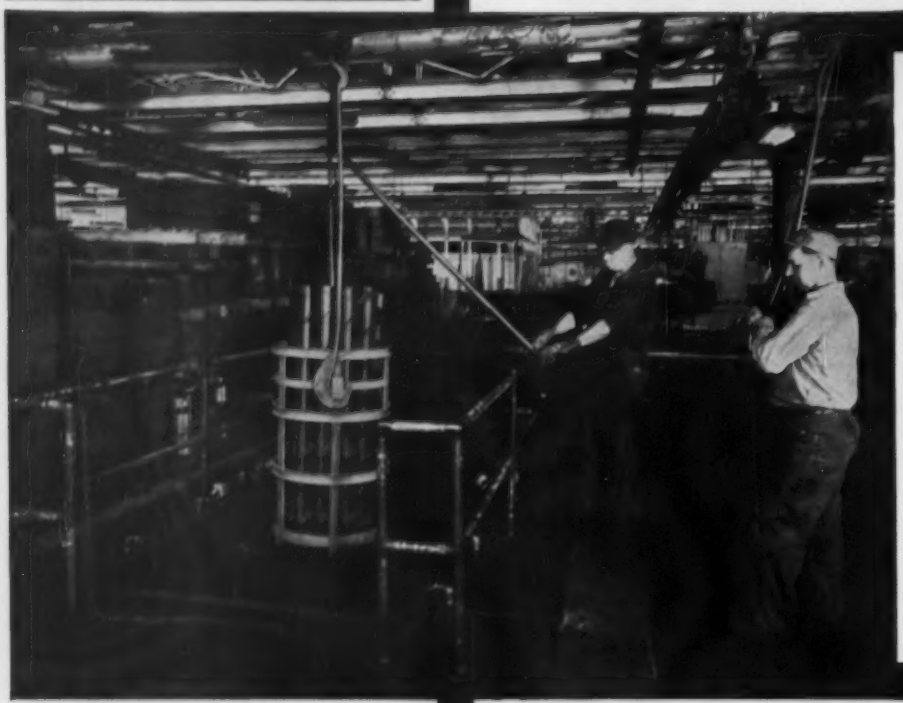
DISSTON HAS THE EDGE®
in special purpose steels
and special steel shapes.

100 YEARS OF FINE STEEL MAKING



PLATECOILS®

speed cooling in subterranean quench oil tank

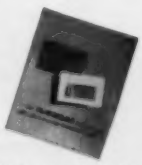


as **coil-itis** * *is cured at National Acme*

PLATECOILS *cure Coil-itis**

Platecoils overcome the limitations and operating difficulties of pipe coils by heating or cooling 50% faster, taking 50% less space and saving up to 50% on initial and maintenance costs.

A bank of Tranter Platecoils is the key to speedier quenching of heat treated parts at National Acme Co., machine tool manufacturer at Cleveland, Ohio. The Platecoils, through which cold water is circulated, are in one section of a divided 2,000 gallon tank. Oil is pumped from this section into the bottom of the quenching half of the tank. At the top, oil spills over a baffle back into the cooling section, setting up a continuous flow of oil, cooled as it passes over the Platecoils. Quenching operations are not interrupted to wait for oil to be cooled as they were when a horizontal tube bundle was used. Maintenance and repair, previously a difficult and time-consuming job also has been simplified. Investigate the possibilities for Tranter Platecoil savings and efficiency in your plant, today!



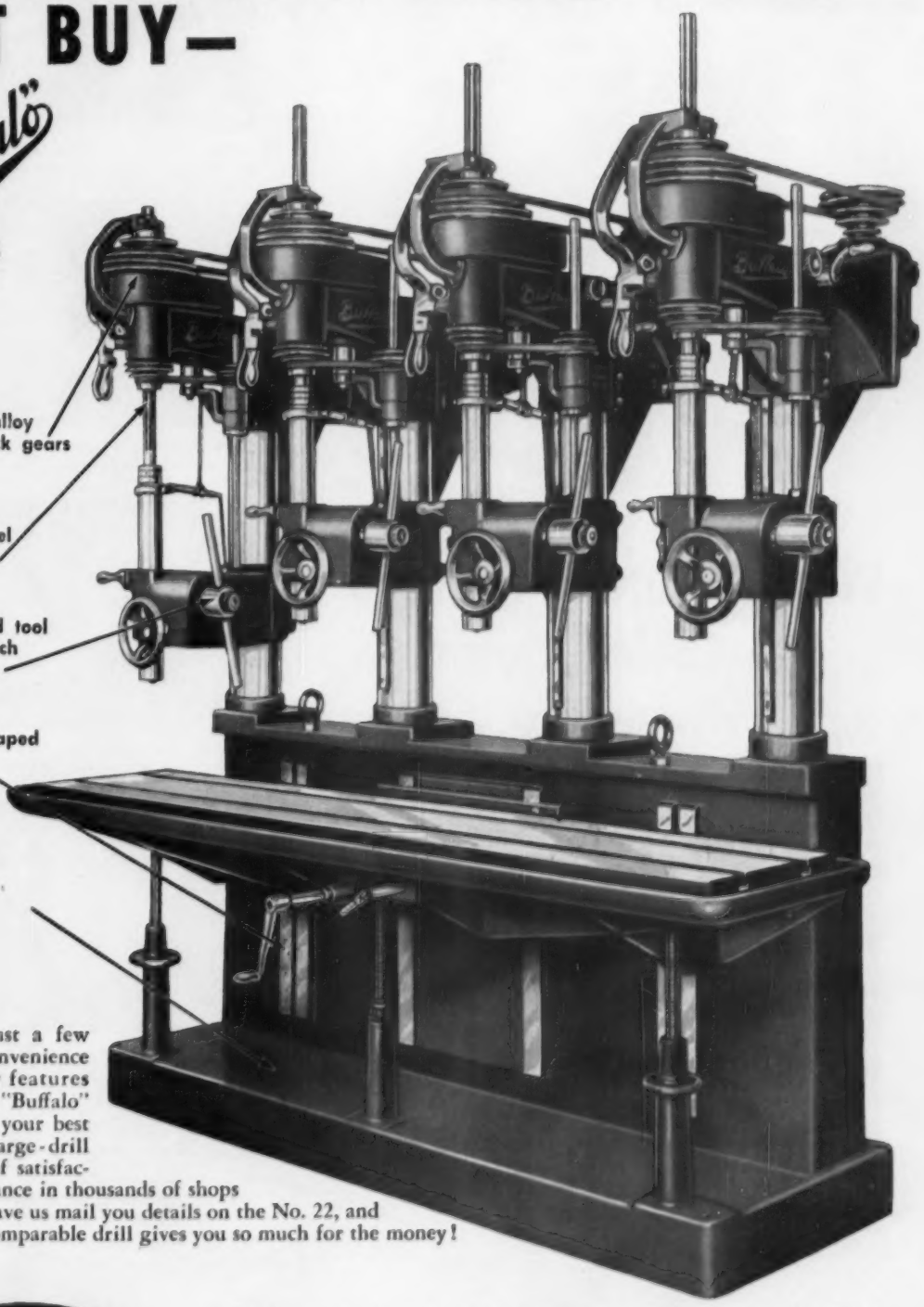
For other examples and uses of Platecoil, write for Bulletin No. P73, a 12-company report.

PLATECOIL Div. **TRANTER MANUFACTURING, Inc., Lansing 4, Michigan**

SEE THE EXTRA PERFORMANCE FEATURES THAT MAKE YOUR BEST BUY—

"Buffalo"

No. 22 DRILL


Forged alloy steel back gears
6 spline alloy steel spindle
Hardened tool steel clutch members
Hand-scraped ways
Coolant reservoir in base

Above are just a few long life, convenience and accuracy features that make the "Buffalo" No. 22 Drill your best buy in the large-drill class. Years of satisfactory performance in thousands of shops prove this. Have us mail you details on the No. 22, and see why no comparable drill gives you so much for the money!

"Buffalo"

BUFFALO FORGE COMPANY

492 BROADWAY BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING • PUNCHING • SHEARING • BENDING

Wagner®
ELECTRIC MOTORS
...the choice of leaders in industry

New NEMA Frames
Standard and Explosion-proof

Type EP
215 Frame

Wagner Totally-Enclosed Fan-Cooled Motors

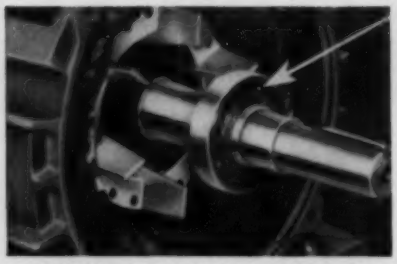
cut maintenance time and costs

Check the features of the new *Wagner Type EP Totally Enclosed Motor.* They spell the difference between needless expenditures in maintenance time and costs . . . and a definite savings in motor upkeep and repairs. You'll find that for general industrial use where dust, dirt, filings, abrasives, steel chips or moisture are present, the Wagner Type EP Motor gives steady, troublefree performance and longer service life.

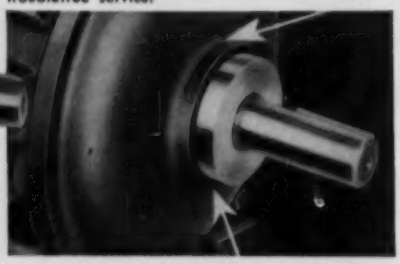
Wagner Type JP Explosion-Proof Motor . . . has the same quality construction as the Type EP – plus added features which make it completely safe to operate where explosive dust, gases or vapors are present.

Both Type EP and JP Wagner motors are available in ratings up to 250 horsepower. For complete information, just call the nearest of our 32 branch offices, or write for Bulletin MU-203.

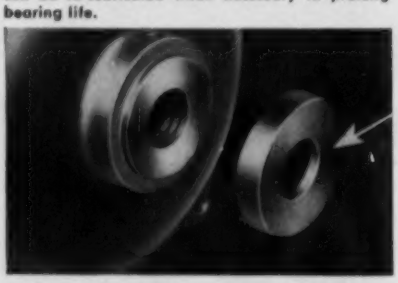
Wagner Electric Corporation
6403 Plymouth Ave., St. Louis 14, Mo.



1 HEAVY-DUTY BALL BEARINGS—Highest quality bearings of more than ample capacity provide long, troublefree service.



2 BEARINGS CAN BE RE-LUBRICATED—Wagner motors can be re-lubricated when necessary to prolong bearing life.



3 BEARINGS STAY CLEAN—Both ends of these motors are equipped with running shaft seals, a machined collar mounted on the motor shaft.

4 EASY TO CONNECT—Large diagonally-split conduit box provides ample room for making connections. Leads are permanently identified.

5 NO GREASE LOSS—Bearing housings have effective seals to prevent escape of grease.

6 RIBBED FRAME—Ribs on the corrosion-resistant cast iron frames add mechanical strength and increase the surface area for more efficient cooling.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

MDS-10

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS–AIR AND HYDRAULIC

IF YOU MAKE *Springs*

YOU'LL DO BETTER WITH ROEBLING

ROEBLING makes high carbon steel spring wire and flat spring steel... and makes it *better*... for every sort of spring and for every product that requires spring characteristics. Hard drawn, hard rolled, annealed or soft, tempered or untempered ...they're all available to meet your requirements exactly.

Among these Roebling materials are zig-zag and no-sag wires; mechanical and valve spring wires; music wire; clock and motor type spring wires; flat spring steel and upholstery spring wire of all types. The variety of parts into which these are formed is almost endless, but manufacturers all report that Roebling quality and uniformity reduce machine downtime.

Learn for yourself how Roebling can help your production and product. John A. Roebling's Sons Corp., Trenton 2, N. J.

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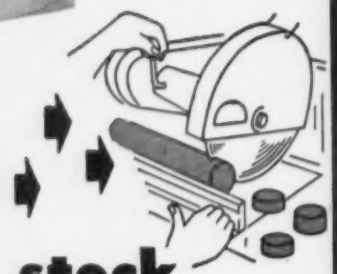
ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK



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carbide bar stock cut to length

Now you can buy super hard **Talide Bar Stock** in bars, strips or rods; in standardized sizes from 1/16" square to ¼" x ¾" rectangular; tubes 1/16" to ⅜" O. D.; rods 1/16" to ½" diameter . . . IN ANY LENGTH. Complete stocks are available at these warehouses:

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Metal Carbides stocks 1325 different sizes of standard, solid Talide Metal in bars, strips, rods, tubes, bushings, rings, flats, tips and discs for immediate shipment. Special shapes furnished up to 25" O.D. in any length and up to 5000 lbs. per piece by weight —for every die and wear part application.

● Metal Carbides produces only top quality metal in latest type vacuum furnaces. From ore to finished product, all operations are rigidly controlled in our new multi-million dollar plant of over 100,000 sq. ft. Write for Catalog 55-G. Metal Carbides Corporation, Youngstown 7, Ohio.

Only Metal Carbides Produces both Sintered and Hot Pressed Carbides

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MC
TALIDE®
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HOT PRESSED AND SINTERED CARBIDES · VACUUM METALS
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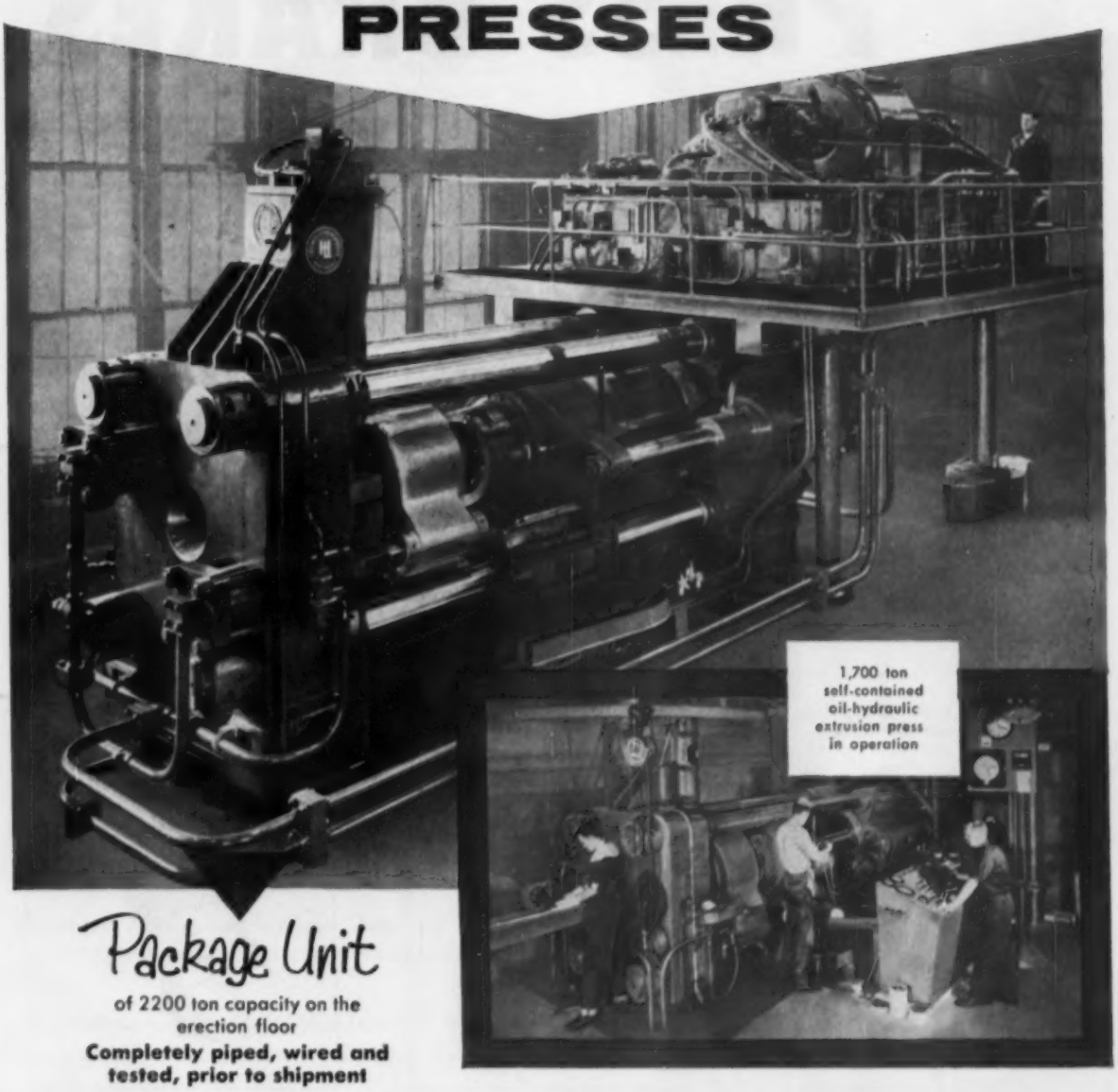
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

LOEWY HYDROPRESS

High-Speed, Oil Hydraulic

EXTRUSION PRESSES



1,700 ton self-contained oil-hydraulic extrusion press in operation

Package Unit

of 2200 ton capacity on the erection floor

Completely piped, wired and tested, prior to shipment

LOEWY HYDROPRESS INCORPORATED

ENGINEERING • CONTRACTING

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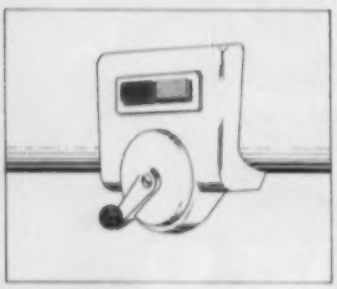
Rolling Mills • Hydraulic Presses • Pipe Testing Machines • Special Pipe Mill Equipment • Accumulators • Pumps

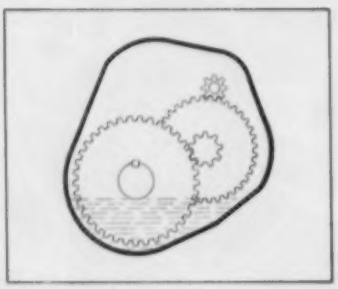
2 New CINCINNATI PRESS BRAKES

THIRTY TON - - - - 2-30 SERIES
FIFTY TON - - - - 3-50 SERIES

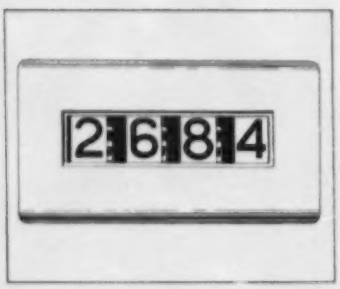
COMPETITIVELY PRICED



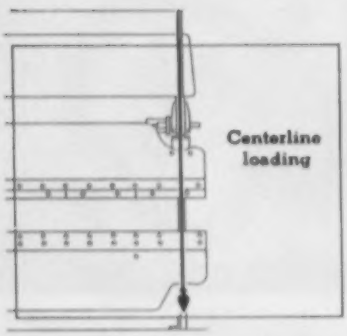
Front controlled, variable speed drive, 20 to 50 strokes per minute.



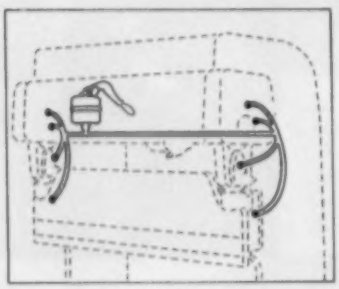
Completely enclosed transmission, running in oil.



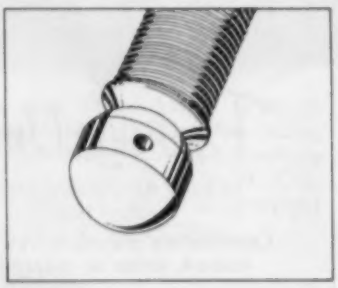
Two micrometer indicators, one at each end of the ram—easy to read and accurately record the amount of adjustment and tilt.



Centerline loading prevents weaving of the housings and insures accurate bends.



Centralized pressure lubrication system.



Ball end on the ram adjusting screws permits tapering of the ram for fade-out work.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

2-30 SERIES

This new 2-30 Series Cincinnati All Steel Press Brake has a capacity of 14 gauge x 6′ mild steel.

Look at these unusual standard features:

2½″ stroke—12″ shut height—9″ throat.

Distance between housings 5′-2″—overall die surface, 6′-0″.

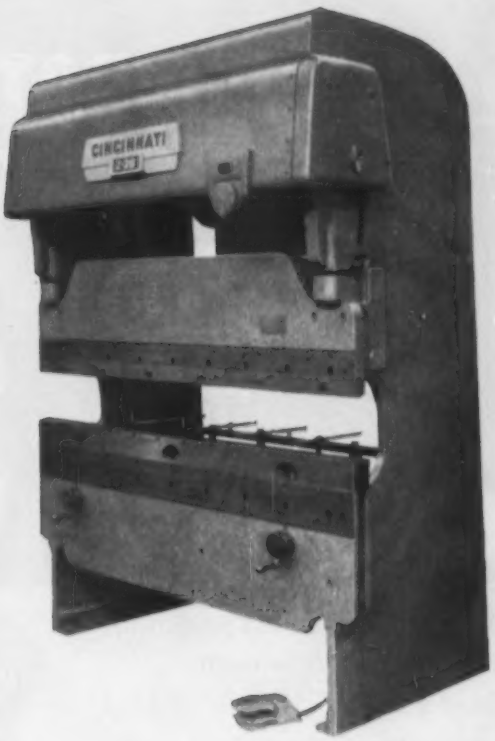
Front controlled, variable speed drive, 20 to 50 SPM. 4″ manual ram adjustment including ram tapering adjustment for fade-out work (power adjustment available as extra feature).

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



3-50 SERIES

These new 3-50 Series Cincinnati All Steel Press Brakes are built in two lengths and have a capacity of 10 gauge x 6′ mild steel. Investigate these unusual standard features: 3″ stroke—12″ shut height—12″ throat—distance between housings 6′-6″ or 10′-6″—overall die surface 8′-0″ or 12′-0″—front controlled, variable speed drive, 20 to 50 SPM.

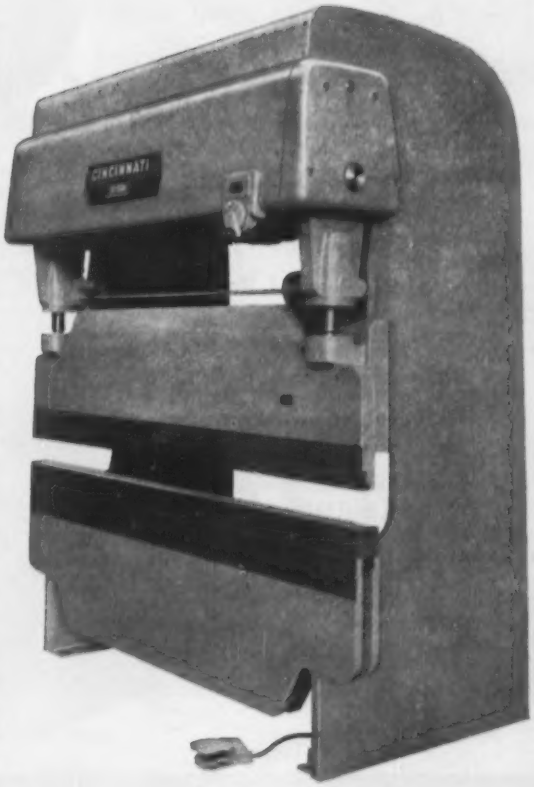
5″ motorized ram adjustment, including ram motor and control, complete with ram tapering adjustment for fade-out work.

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.

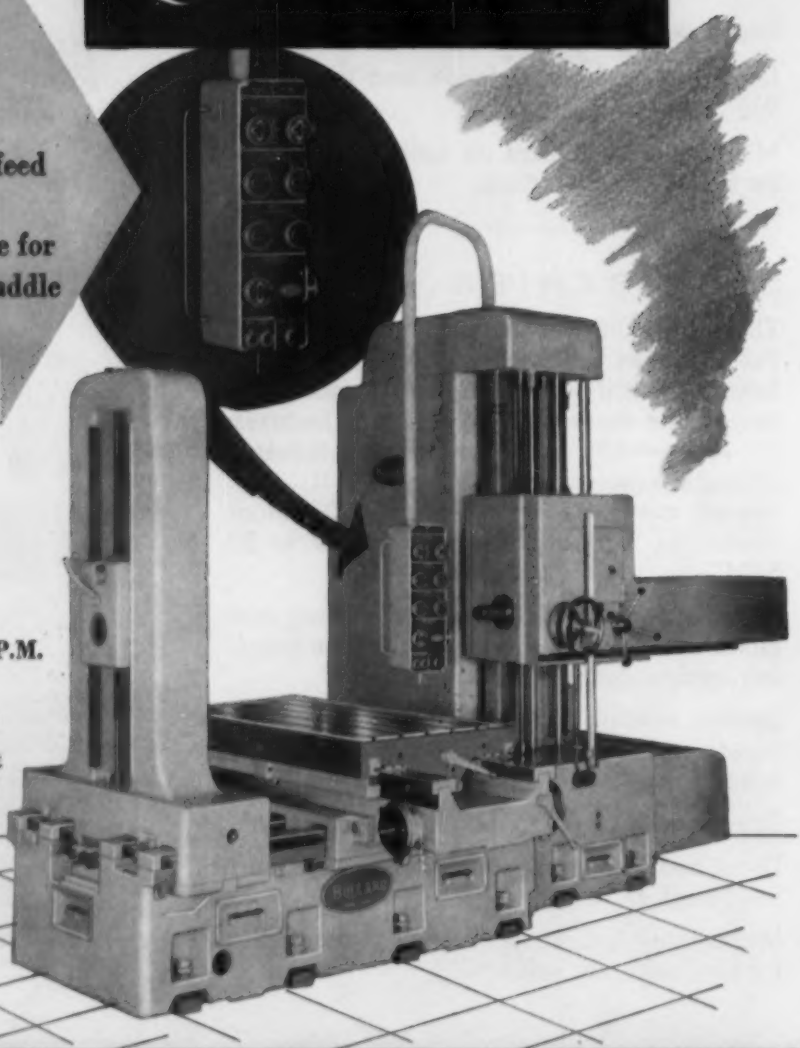


NEWEST

SEVENTY FIFTH
BULLARD
ANNIVERSARY

HORIZONTAL BORING MILLING and DRILLING MACHINE

PENDANT CONTROL
Complete machine control from a movable station for feed and speed selections, directional feed and traverse for Spindle, Head, Table and Saddle



ADDITIONAL FEATURES

- Both Screw and Rack Feed to the spindle
- Massive 4-Way Bed, Head, Headpost and Rear Post for rigidity
- Spindle Speed up to **2000 R.P.M.**
- Replaceable Ways, chrome hardened, on Bed and Saddle
- Optical measuring equipment for head and table (optional)

FOR FULL INFORMATION CALL YOUR NEAREST BULLARD SALES OFFICE OR DISTRIBUTOR OR WRITE . . .

THE BULLARD COMPANY | BRIDGEPORT 2, CONNECTICUT

CRI-DAN

E

FOR EXCELLENCE in all Threading Operations

Presenting the "E"

...a heavier, huskier, hydraulically controlled

CRI-DAN

It's Here—At Your Request. Yes, the tremendous acceptance of Cri-Dan "B" and Cri-Dan "D" has resulted in the development of a larger, heavier precision threading machine greatly extending the range of the Cri-Dan Single Point Threading Method. Not only precision threading but secondary turning, boring, facing and chamfering facilities are incorporated in the Cri-Dan E; complete hydraulic and electric controls assure maximum efficiency even on the heaviest applications. A quick check of the specifications will show the ruggedness and range of this, the newest and finest Cri-Dan Single Point High Speed Threading Machine ever developed. Write The Lees-Bradner Company, Cri-Dan Division for specific information on the processing of your parts.

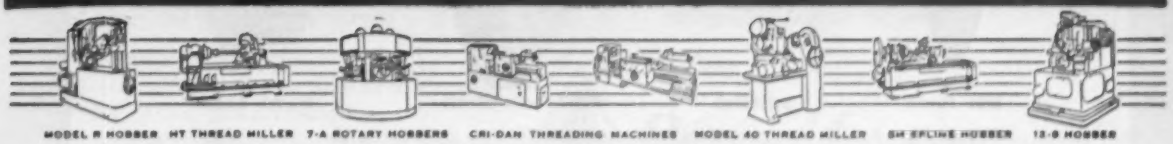
SPECIFICATIONS

Threading Range	2 TPI-48 TPI	Max. Taper of Thds.	15° Included
Max. Thd. Dia. (Internal)	16" Dia.	Multi-Start Threads	Yes
Max. Thd. Dia. (External)	12" Dia.	Spindle Speeds	50-1400 RPM
Max. Swing Over Ways	25" Dia.	Main Motor	20 H.P.
Max. Swing Over Tool Slide	12" Dia.	Floor Space Req'd	5'6" x 14'0"
Max. Thread Length	6½"	Approx. Weight	4½ Tons
Length Between Centers	2'6", 5'6" & 8'6"		

CRI-DAN DIVISION

the LEES-BRADNER Company

CLEVELAND 11, OHIO, U.S.A.



MODEL R HOBBER · HT THREAD MILLER · 7-A ROTARY HOBBERS · CRI-DAN THREADING MACHINES · MODEL 40 THREAD MILLER · SM SPLINE HOBBER · 12-S HOBBER

IF YOU THREAD OR HOB . . . GET A BETTER JOB WITH A LEES-BRADNER

Behr-Manning pioneers an

The KON-TOOR WHEEL is ideal for automatic and semi-automatic straight line and rotary production

AN EXPLODED VIEW OF WHEEL COMPONENTS...

SIDE PLATE | BUSHING | KON-TOOR WHEEL | WHEEL CAGE

The KON-TOOR WHEEL is constructed of numerous segments of double-faced abrasives and is available in face widths 2" to 7" inclusive – Flexible or stiff construction. Multiple wheels can be used for widths over 7".

For the newest in coated abrasives... watch BEHR-MANNING!

entirely new concept in polishing!

...the ALL coated abrasive KON-TOOR® WHEEL

CAN BE SHAPED TO CONTOUR

Note how the KON-TOOR WHEEL hugs the radius of this stainless steel cooking utensil.

PRODUCES FINER FINISHES

An intricate radius on a pressure cooker cover gets polished by a 2" face KON-TOOR WHEEL.

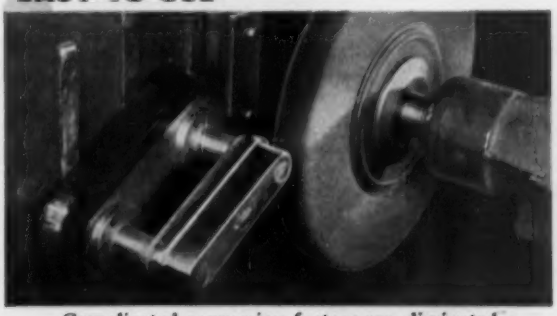
MINIMUM LUBRICATION REQUIRED

It cuts cooler all the way – A 2" face KON-TOOR WHEEL polishing a drawn steel coffee pot.

CUTS FINISHING COSTS

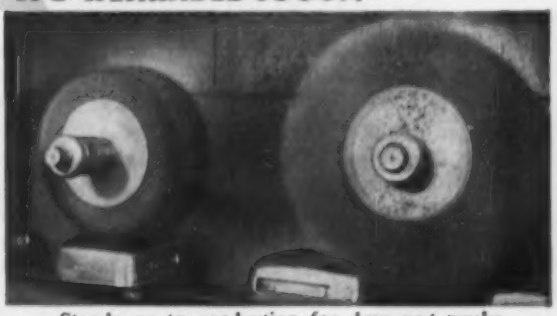
Polishing production soars with the KON-TOOR WHEEL on jobs like this aluminum stamping.

EASY TO USE



Complicated conversion factors are eliminated. The KON-TOOR WHEEL is easily adapted to standard lathes and work-holding fixtures.

IT'S WEARABLE TOO!!!



Stands up to production for days and weeks instead of hours – note wheel at left still producing after days on the job.

● For details, contact your local Behr-Manning Field Engineer, or write today to Behr-Manning, Troy, N.Y., Dept. IA-9.

In Canada: Behr-Manning (Canada) Ltd., Brantford.
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G-15

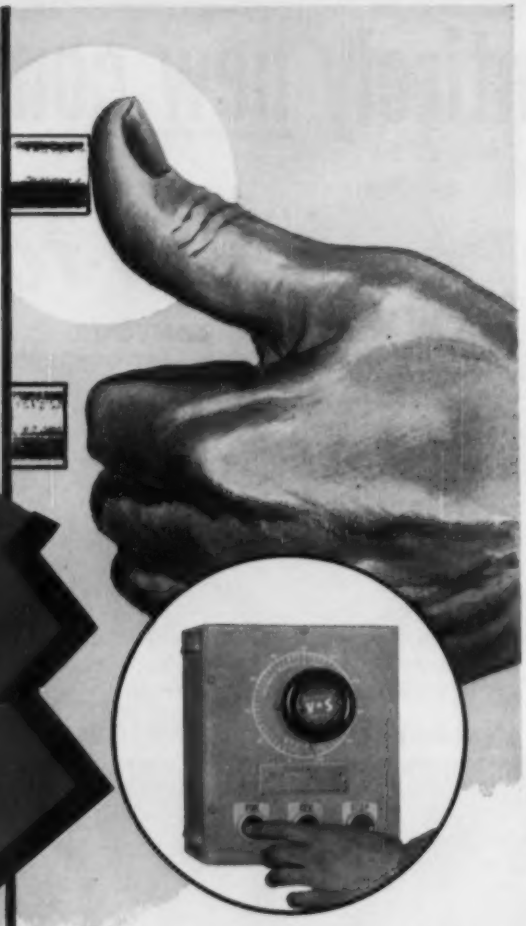
BEHR-MANNING
division of NORTON Company

▲ COATED ABRASIVES
▲ SHARPENING STONES
▲ PRESSURE-SENSITIVE TAPES

Everything's under control...

with the

RELIANCE V★S DRIVE ®



Smooth, versatile Reliance VARIABLE SPEED DRIVES are made to help you keep *everything under control!*

Dynamic response for rapid starting, stopping and reversing; hairline accuracy for maintaining required line speeds; positive, step-by-step assurance of optimum speeds during each processing cycle; precise delicate regulation of quantity, quality, color, shape, form and size . . . in fact, EVERYTHING is precisely controlled by Reliance V★S Drives.

For faster line speeds, smoother acceleration and deceleration, more sensitive tension control and other outstanding production dividends in *your* plant, call the nearest Reliance sales office . . . or write for Bulletin D-2311. *Reliance Electric & Engineering Co., 1083 Ivanhoe Road, Cleveland 10, Ohio; Canadian Division—Welland, Ontario.*

D-1498

RELIANCE ELECTRIC AND ENGINEERING CO.

Question Mark
POLYGONIA INTERROGATIONIS

Attractive

In the world of nature there are few creatures which match the butterfly in range of color and ability to add beauty to any outdoor scene.

The forest-dwelling Question Mark, which derives its name from curved color markings under its wings, is found throughout the eastern areas of North America from Canada to Mexico. It is eagerly sought by collectors for its beauty and perfection.

In the world of materials there are few metals which match aluminum for its ability to harmonize readily with indoor or outdoor settings. Aluminum in its natural state possesses a pleasing silver-grey sheen and a high reflectivity. A variety of interesting decorative effects may be produced on aluminum by finishing processes similar to those used on other metals.

Some of the special finishing processes also furnish protection against corrosion, improve the surface reflectivity, and increase aluminum's resistance to abrasion.

Aluminium Limited Sales, Inc. is the distributor in the United States for aluminum from Canada. Why not investigate making your products of aluminum?

Attractive

Aluminum for Commercial, Industrial and Residential Buildings. The decorative value and practical function of aluminum is so well recognized that architects and builders are deliberately combining aluminum with other materials for attractive effects in exterior and interior treatments.

ALCAN
Aluminum *from* Canada

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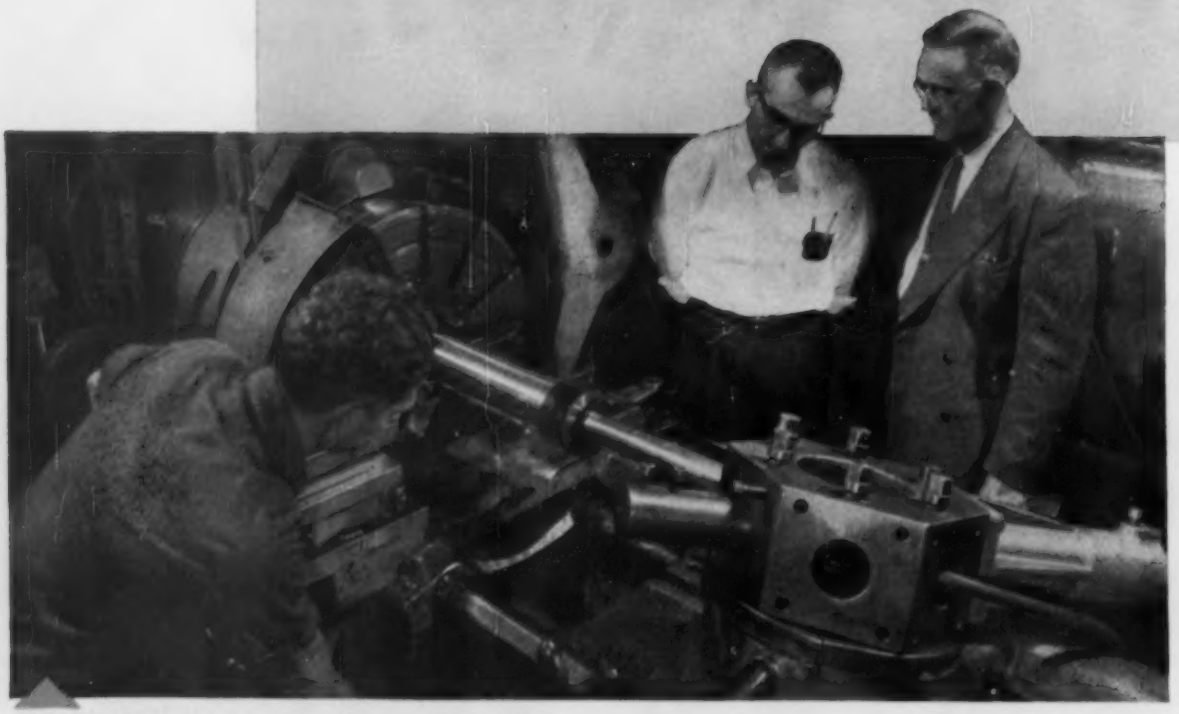
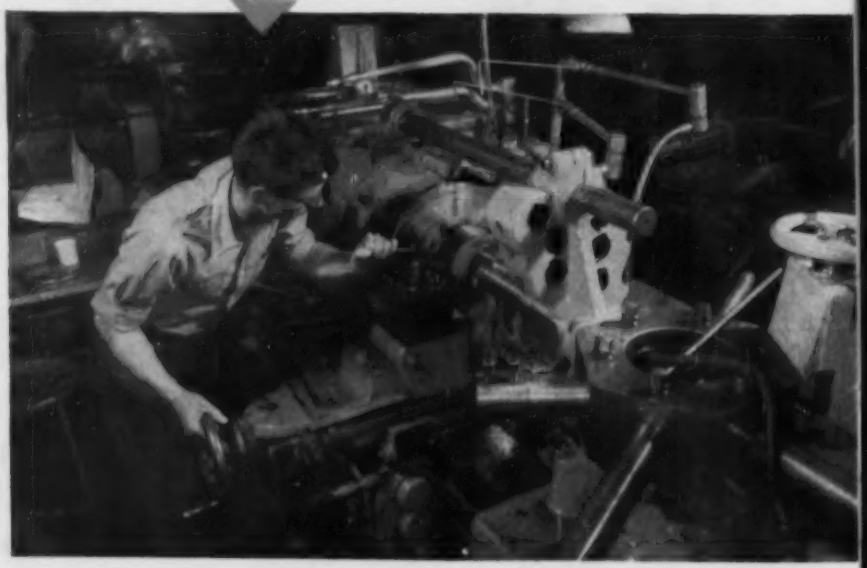
Drilling, Threading,
GULF ELECTRO



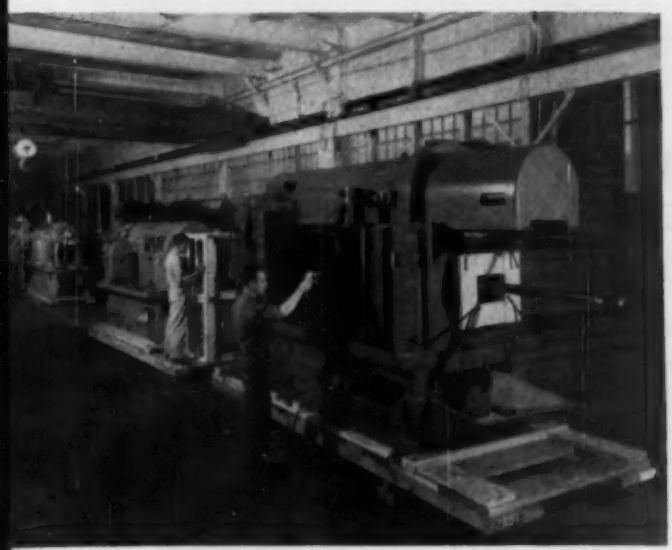
Mr. E. T. Edvinson, Shop Foreman, and Gulf Sales Engineer Ralph E. Parkhurst check up on the performance of Gulf Electro Cutting Oil in a turret lathe where a spindle for a Cone Automatic Machine is being reamed. Steel is SAE 8620.

Gulf Electro Cutting Oil provides high sulphur activity for this drilling operation where finger holders for Cone Automatics are being formed. Steel is SAE 1045.



or Reaming . . . tests prove CUTTING OIL BEST

at Cone Automatic Machine Company, Windsor, Vermont



A lineup of Cone Automatic Machines is readied for shipment. Note the Gulf Rust Preventive being sprayed on vital parts for protection during shipment. Tests in this plant proved the superiority of Gulf Electro Cutting Oil in drilling, threading, and reaming with many types of steel.

"We tried a number of cutting oils over a period of years before we settled on Gulf Electro for jobs that require a sulphurized fluid," says Mr. E. T. Edvinson, Cone Shop Foreman. "Gulf Electro Cutting Oil delivers the best results for us, and has contributed to longer tool life and greater production."

Here's why Gulf Electro Cutting Oil performs better on the jobs for which is is recommended: Thanks to a special Gulf process of combining sulphur, it provides greater sulphur activity over the entire range of a cutting operation. This means better protection for the tool and a smoother machining operation.

Let a Gulf Sales Engineer help you discover opportunities to put Gulf Electro Cutting Oil to work—profitably—in your shop. Write, wire, or phone your nearest Gulf office.

GULF

Gulf Oil Corporation · Gulf Refining Company

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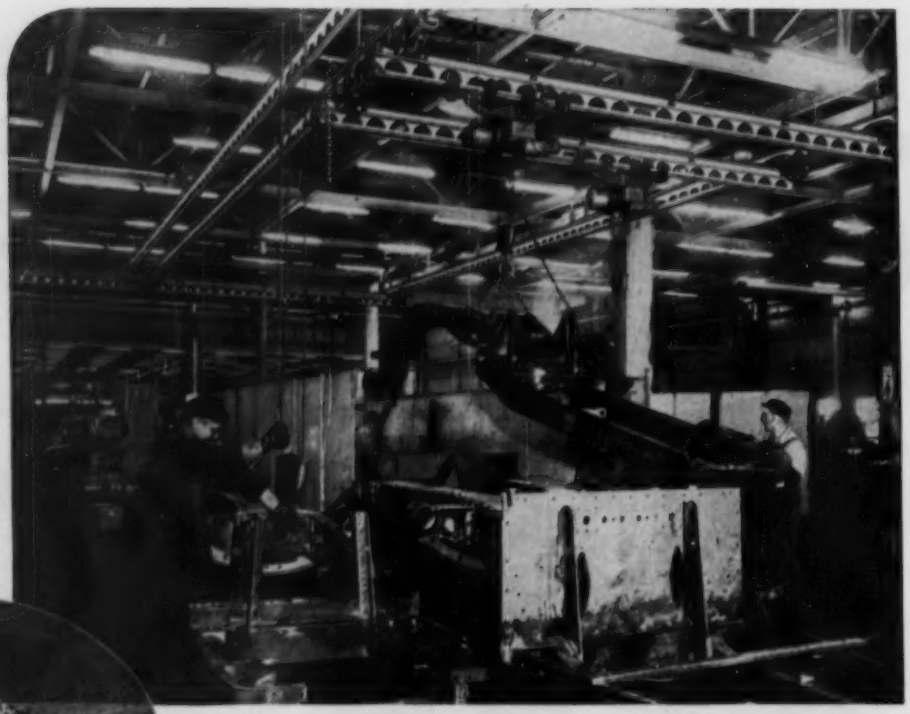

A hand-propelled interlocking crane system with two-ton electric hoists makes the handling of heavy parts easy in the Motor Grader Frame Assembly Section, Peoria, Illinois, Plant.

Caterpillar Diesel No. 12 Motor Grader in action.

EXTENSIVE TRAMRAIL INSTALLATIONS SERVE TWO GIANT CATERPILLAR TRACTOR CO. PLANTS

Peoria Plant Alone Has $1,000,000 Installation

SINCE the first small initial order for Cleveland Tramrail was placed by Caterpillar Tractor Co. over a quarter of a century ago, their installation has grown steadily until now in the vast Peoria Plant alone there is considerably more than one million dollars' worth in operation.

A large part of the job in building tractors, motor graders, diesel engines, etc., is handling materials. It is calculated that 20 tons of handling is required for each ton of tractors or diesel engines shipped from the plant. Saving a few minutes on each ton handled, amounts to a tremendous overall figure and resultant dollar savings.

Because of changes brought about by rapid plant growth, new models, or adoption of more advanced methods, for which Caterpillar is noted, it is often necessary to dismantle and re-erect Tramrail equipment. The ease with which this can be done with Cleveland Tramrail has proven to be especially advantageous to Caterpillar. Equipment serving one area can be taken down and installed in another area for use on an entirely different handling operation in very little time and usually without interfering with production.

Like Caterpillar, your plant, whether large or small, most likely can profit with Cleveland Tramrail.

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Sciaky patented Three-Phase Welder at Colorcraft, Indianapolis, Indiana.

PRODUCTION COSTS CUT 50%

with One Sciaky Patented Three-Phase Welder

One small, standard Sciaky Three-Phase welder and *one* worker, not skilled, now join more aluminum pitchers and handles for Colorcraft than three workers previously did with screws. Cost per unit is cut in half. Production is increased from 140 to 160 units per hour. Rejects have virtually been eliminated and welds are neater in appearance than screws.

A Sciaky balanced load Three-Phase welder with 85% power factor (compared to 30% for conventional single phase) and a 50% reduction in power demand, is far less expensive to operate than unbalanced load welders. Installation cost is estimated at half that of single phase.

Write today for "Resistance Welding at Work," Vol. 4—No. 3, detailing Colorcraft's story. It's dramatic proof of Sciaky's basic thinking—welders designed for *more useful work* at *lowest operating cost* with *maximum reliability*.

FACTS ABOUT SCIAKY'S PATENTED THREE-PHASE

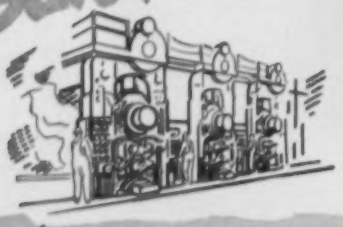
	SINGLE-PHASE	SCIAKY THREE-PHASE	SAVINGS
TRANSFORMER RATING	250 KVA	100 KVA	150 KVA
WELDING KVA DEMAND	650 KVA	325 KVA	325 KVA
LINE AMPS PER CONDUCTOR 440 V.	1,476 A.	430 A.	1,046 A.
POWER FACTOR	30%	85%	Greatly Improved
INSTALLATION COST—EST.	$10,500	$5,250	$5,250

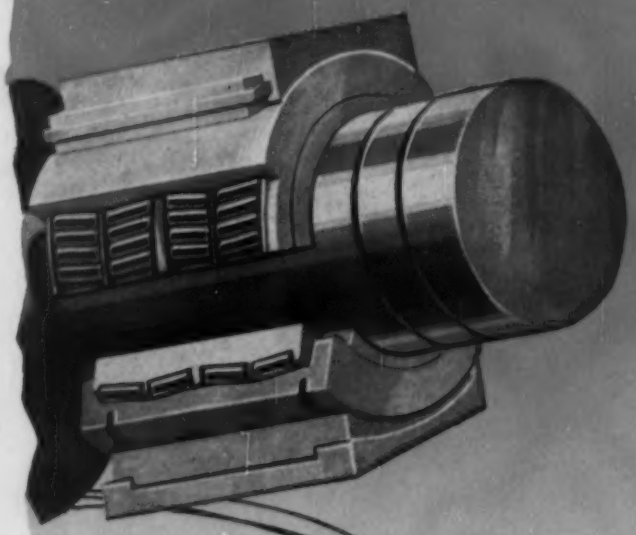
Largest Manufacturers of Electric Resistance Welding Machines in the World

SCIAKY

Sciaky Bros., Inc., 4923 West 67th Street, Chicago 38, Illinois

FOR SEVEREST ROLLER BEARING SERVICE





BROOKS* LEADOLENE 375

*THE I.P. LUBRICANT WITH *Indestructible pH-ilm*

Brooks Leadolene 375 provides safe, trouble-free lubrication of roller bearings under heaviest loads, overloads and severest shock conditions, such as experienced in heavy duty work roll service on 4 high hot strip mills, reduction mills and temper pass mills. Developed through years of research, this modern industrial lubricant provides corrosion resistance to component parts of bearing from cooling water and other contaminating actions.

Available in three grades . . .

Leadolene 375 Light: For normal or moderately high temperatures, with repellence of water a dominant factor. Excellent pumpability.

Leadolene 375 Medium: For heavier load and higher temperature requirements. Prevents leakage through seals. Excellent pumpability. Affords year around service under all temperature conditions.

Leadolene 375 Heavy: For pressure gun or system applications in normal or high temperatures. Good pumpability.

A Brooks lubrication engineer will gladly call at your request. Write, phone or wire today.

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Please send bulletin on Leadolene 375.

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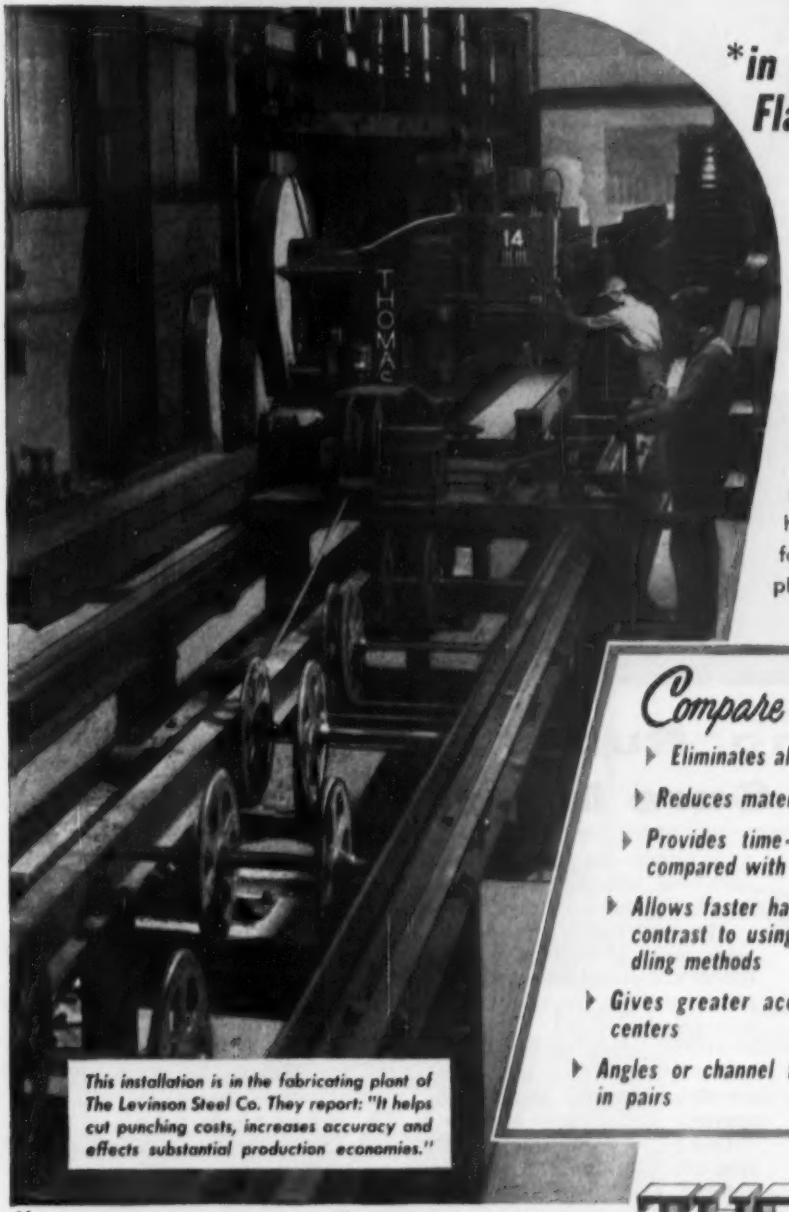
576 holes punched*

in 25 minutes – without layout!



This installation is in the fabricating plant of The Levinson Steel Co. They report: "It helps cut punching costs, increases accuracy and effects substantial production economies."

*in the web of a 24" Wide Flange Beam 40 ft. long

An Eastern Fabricator used this 225-ton Beam Punch with Motorized Indicator Spacing Table to meet a very special punching problem. His requirements were for the maximum number of punchings in minimum time on a 24-inch wide flange beam forty feet long.

This Thomas combination, requiring no layout, solved his problem. It can help you, too, as proved by the performance records of machines in the plants of other important fabricators.

Compare these Advantages...

- *Eliminates all layout and marking*
- *Reduces material handling*
- *Provides time-saving multiple punching as compared with ordinary single hole punching*
- *Allows faster handling through the punch, in contrast to using jib cranes and other handling methods*
- *Gives greater accuracy than punching to centers*
- *Angles or channel flanges may be handled in pairs*

44

The trend is to THOMAS

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

..... in Punches • Shears • Presses • Spacing Tables • Benders

Photo Courtesy of Seco Safety Products Co.

Flat-Folding, Rubber-Lined Hose For Quick, Sure Action Protection

Qua-Flex fire hose is specially constructed to fold flat. This makes it highly adaptable for storage on racks, even those designed for unlined linen hose. When hose is pulled from rack, pins drop easily and hose does not kink. It takes up less space than most other types of fire hose. That's why it's so popular for fire protection service in office buildings, institutions, industrial plants, ships, or wherever space is limited. It is quickly and easily dried after use; hence frequent testing doesn't damage it.

This hose is ideal for use with a fog nozzle—an advantage over linen hose, and one that is usually found only in larger, heavier hose.

The tube is made of a slow-aging, non-acid-forming, synthetic rubber compound that always remains resilient, resists cracking and stays leak-proof. The jacket is evenly woven of long staple cotton yarn. Tube and jacket are tightly bonded together for strength and long life.

Qua-Flex is available in I.D. sizes 1½", 2" and 2½", all guaranteed to withstand a test pressure of 300 p.s.i., in 25, 50, 75 and 100 foot lengths. Popular 1½" size has Factory Mutual Approval.

We also manufacture a complete line of industrial and municipal fire hose, as well as a complete line of industrial rubber products: belting, hose, packing and moulded rubber of every construction for every need. *Through your Quaker and Quaker Pioneer distributor* our research and engineering services are always available to help you solve any fire protection or industrial rubber problem. *Write for free folder and name of nearest distributor.*

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HIGH SPEED BLANKERS—
Cir. No. 915-N-2

Detailed information on 2 sizes of presses for mass production blanking, piercing, shallow drawing and forming. Speed range 300 to 900 rpm. Shows machines from several angles, gives close-ups of design details and pictures typical work samples. Complete specifications included. 8 pages.

TANDEM ROD MILLS—
Cir. No. 729-R

8-pager on mills for high speed reduction of non-ferrous and ferrous rod. Shows various sizes of mills plus work samples and a cross-sectional reduction sequence. Tells how mill can reduce operating costs. Also discusses pay off unit, straighteners, coilers and cooling method. Table gives capacities and other data.

MULTIPLE PLUNGER PILLAR PRESSES—
Cir. No. 754-N-2

8-page illustrated booklet presents latest features in WF multiple station pillar presses. Gives specifications and capacities for six sizes. Shows typical work samples and also covers accessory equipment.

2-HI ROLLING MILLS—
Bul. No. 111-R

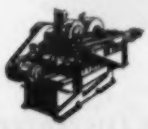
Gives general information on wide variety of 2-Hi mills for cold or hot rolling. Rolls range from 5" dia. to 24" dia. Pictures five different sizes.

INCLINED, SHELL THREAD ROLLING MACHINE—
Cir. No. 833-EL-2

Describes and illustrates automatic inclined shell threader for attachment to eyelet machine or with independent feed. Covers use, construction, operation and drive. Shows work samples and has table of specifications.

WIRE FLATTENING MILLS—
Bul. No. 110-R

Gives information on mills with production speeds approaching 3,000 FPM. Shows various sizes. Rolls range from 4" dia. to 12" dia. Includes data on edgers, pay-offs, winders, drives, coolant system, etc.



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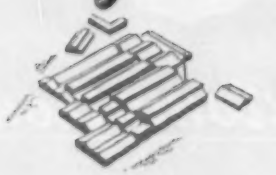
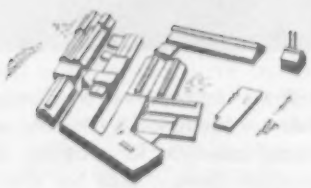
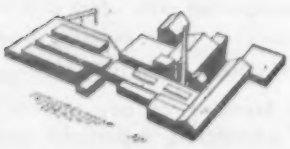
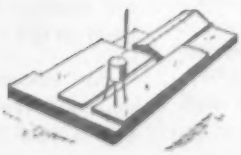
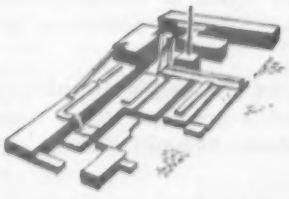
I tell you, it gives a guy a lift to deal with folks like that. Guess it's true that "the bigger they are . . . the bigger they act". Call 'em up sometime and see!











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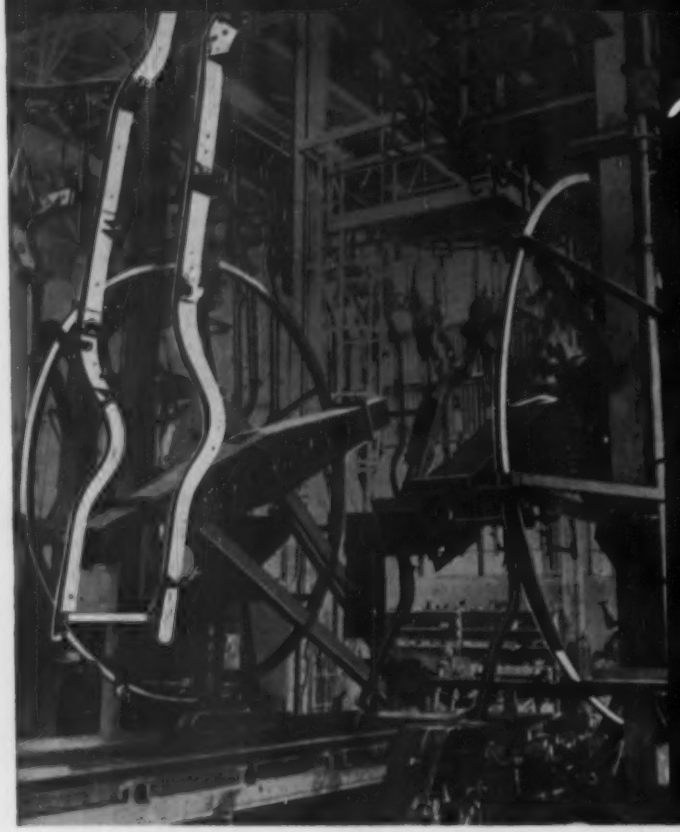

Automatically

Ferris wheel developed by Webb automatically lifts frames from assembly line and hooks them on overhead trolley conveyor.

. . . Another Example of

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For automatic handling of any size or type of material, Webb engineering experience and reputation is your best assurance of receiving the finest in conveyor automation.

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TIMKEN® TQIT roll neck bearings in new United 4-hi, 4-stand mill give interference fit with easy removal

ALAN WOOD Steel Company's new 4-hi, 4-stand tandem cold reduction mill, built by the United Engineering and Foundry Company, uses Timken® 4-row tapered bore tapered roller bearings on the back-up rolls.

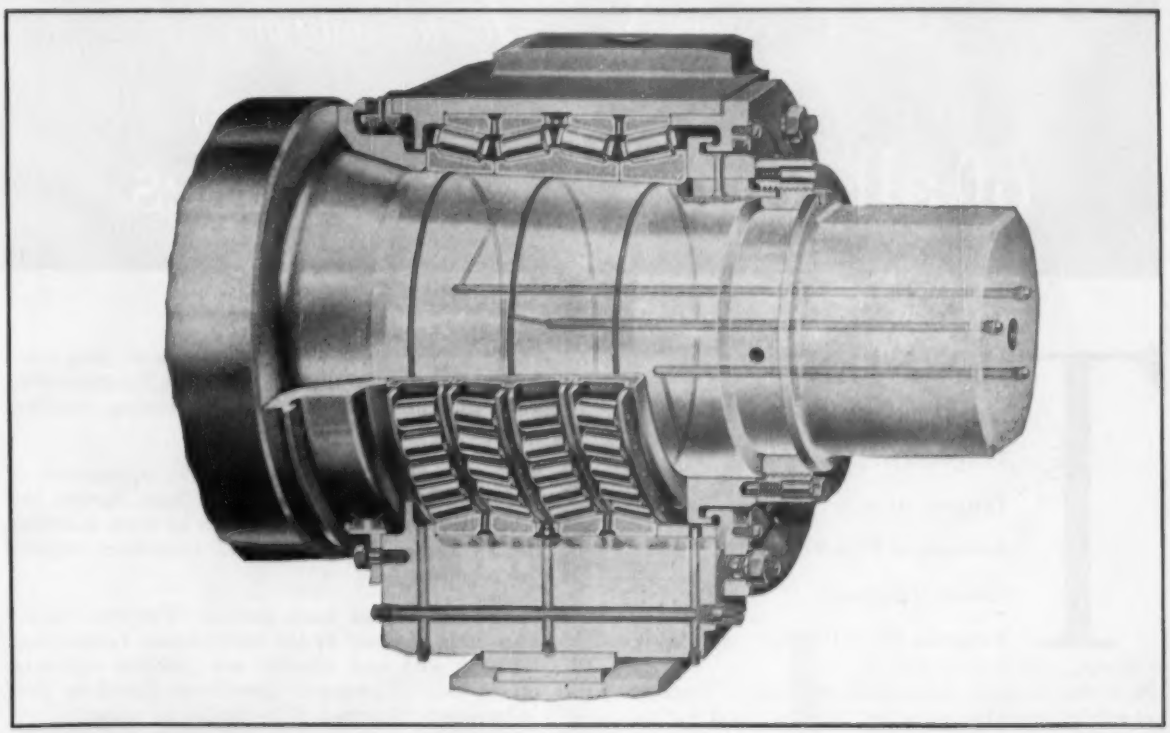
This new roll neck bearing combines maximum bearing capacity and interference fit with easy removal. It can be quickly removed from the roll neck by expanding its cones hydraulically. Excessive scuffing and neck wear are eliminated. The interference fit of the cones with the roll neck provides greater stability between cones and roll neck and gives better load distribution within the bearing. It also permits improved fillet contours and larger necks. Result: lower neck stress and deflections than any other arrangement.

Timken bearings use economical grease lubrication. There's no loss of lubricant during roll changes. Rolls can be changed faster because there are no pipes or tubes. And there's no need for special thrust bearings because the tapered construction of Timken bearings lets them take radial and thrust loads in any combination.

With Timken bearings, higher mill speeds are possible, and starting resistance is reduced to a minimum so there's no roll scuffing or scoring of steel. That's because Timken bearings practically eliminate friction—design, by geometrical law, gives them true rolling motion . . . and they're made extremely accurate to live up to their design.

Get all the advantages of the Timken TQIT bearing in your mill. For more information, write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



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Our field and service engineers have had years of experience with problems of roll neck bearing design and operation. They'll help you select bearings and design mountings.

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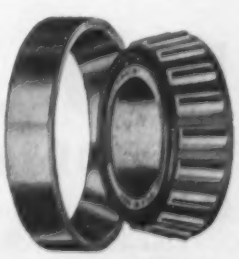

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ↕ AND THRUST →○← LOADS OR ANY COMBINATION →✳←

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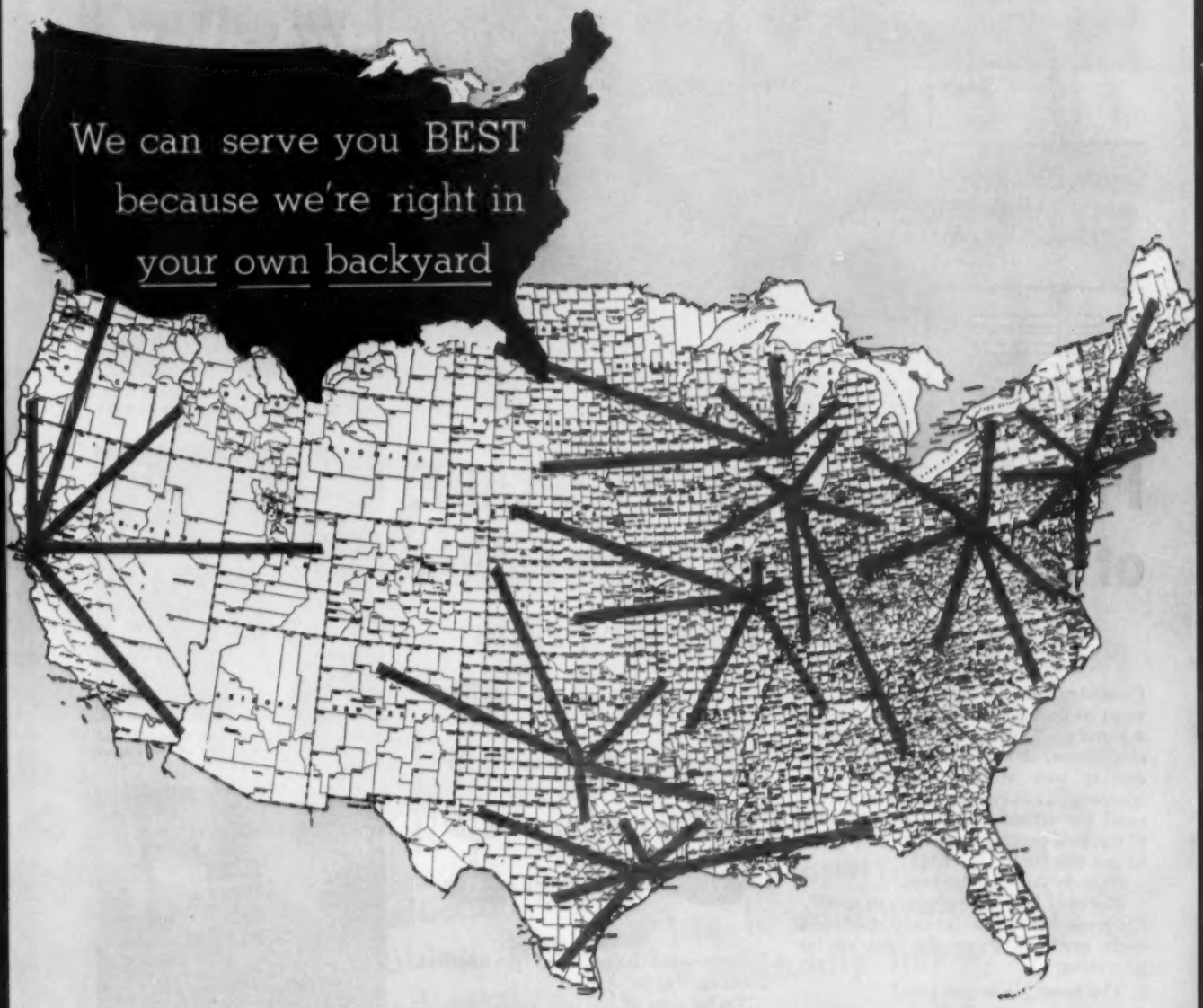

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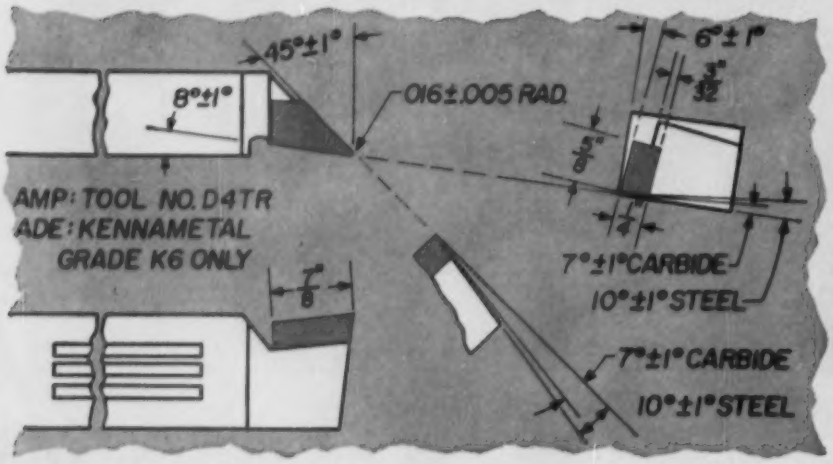
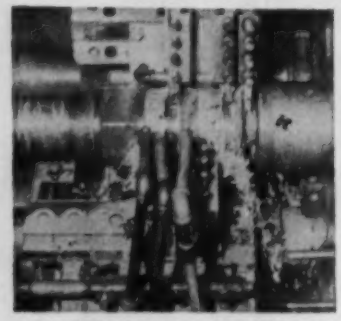
IT PAYS TO BE SPECIFIC!



PROVED BEST TEST AFTER TEST



Grade K2S—Rough turning SAE steel housing assemblies reduced from 45 to 18 minutes each.

PINPOINT THE RIGHT GRADE of carbide for each operation

when you make up your prints

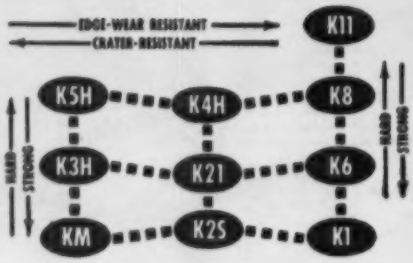
Consistent carbide performance is a must in keeping production lines moving and costs under control. Even brief shutdowns, or shortages along the line due to tool trouble, can send costs zooming . . . at station after station . . . until the added costs far exceed that of the best carbide available. So it pays to get the best.

How do you get the best?

The only way, of course, is to specify the grade found best for each operation —the grade that does the best job by providing:

1. The most pieces per grind
2. The longest life per tool or per insert
3. The most consistent *repeat* performance—regrind after regrind or insert after insert.

When you specify Kennametal* tooling, you can depend on top performance . . . consistently . . . from the first run, through each regrind, tool after tool. It helps you forecast performance with assurance because every Kennametal grade has high *reserve* strength . . . the strength needed to stand up to wide variations in materials and machines.



Kennametal helps keep production flowing.

To be sure of the best performance, specify Kennametal. But be specific . . . specify by grade. Once you have the grade pegged for a job, show it on the print . . . added protection that will help you realize dividends through increased production.

A Kennametal Tool Engineer will help you select the *right* grade of Kennametal for each operation. He works exclusively with Kennametal . . . applying and servicing it. His specialized experience could be of great value to you. KENNAMETAL INC., Latrobe, Pa.

*Registered Trademark

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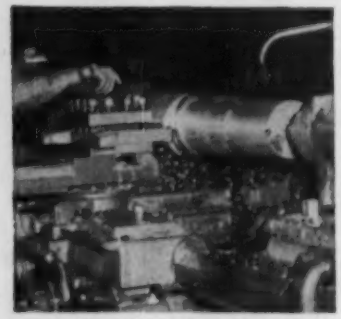
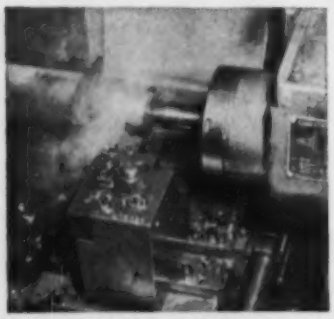
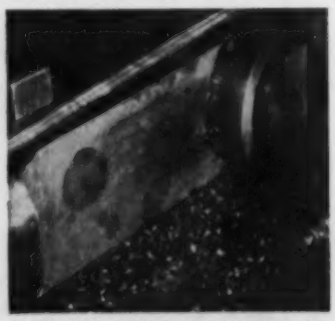


Grade K2S—Floor to floor time reduced 34% for machining ends of steel drive shafts, requiring 9 passes.



Grade K3H—Kennametal tooling reduces machining time 60% on chrome-nickel-moly bar stock.



Grade K2S—10 times longer cutting life, with 8 times faster speed and feed with Kennamill* milling.

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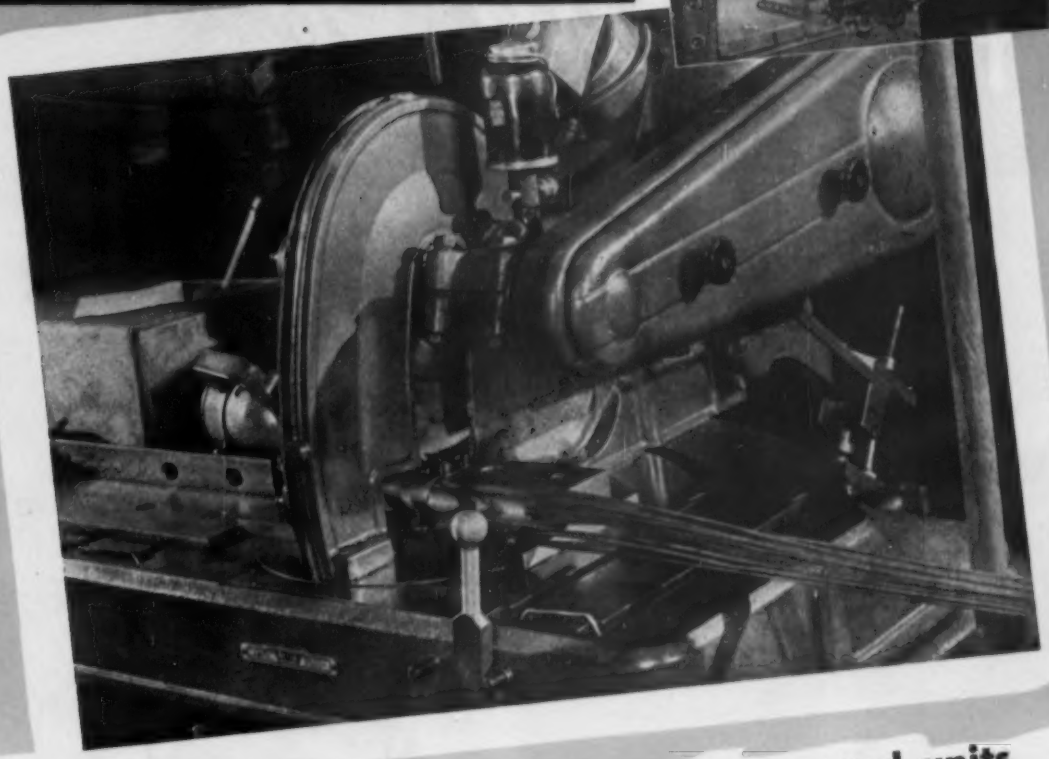
Standard Cut-off Saws Made Automatic with Inexpensive Air Motors*



Not only is production over manually operated units frequently doubled, but saw life is measurably increased and quality of cut markedly improved.

TAKE VIRTUALLY ANY MAKE of cut-off saw. Add a Bellows Air Motor with Hydro-Check control to feed the saw through the work — a second Bellows Air Motor, electrically interlocked with the first, to feed the work to position, and one or more interlocked Air Motors to hold the work . . . and you have a fully automatic, high production machine.

The installation can be made quickly in your own shop from detailed prints we will furnish. And the chances are excellent the total cost will be recovered with the first few weeks of added production.

Conversion of cut-off saws to automatic operation is but one of many ways you can use Bellows "Controlled-Air-Power" to obtain faster production at lower cost. Any hand operated machine tool, such as drill presses, milling machines, grinders, etc., can be made automatic with Bellows equipment, quickly and inexpensively.

Let us send you without cost—

Detailed prints of various ways Bellows Air Motors can be used to convert cut-off saws to automatic units, together with photos of typical installations.

Address: The Bellows Co. Dept. 1A955, Akron 9, Ohio.

*The Air Cylinder with the *built-in valve.* 1255A

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Akron 9, Ohio

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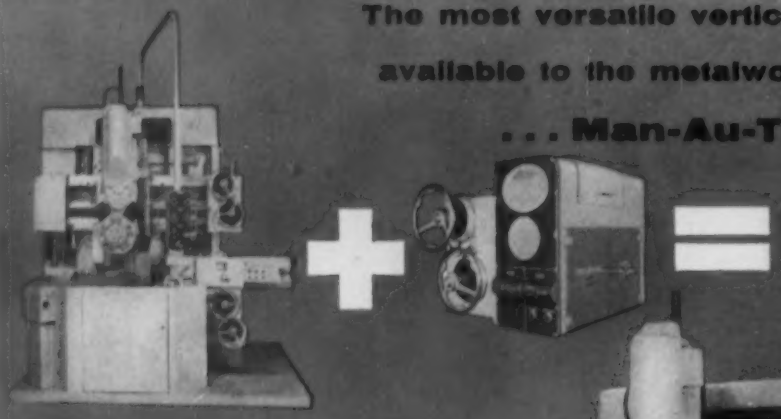
Machine Tools for *Today* and *Tomorrow!*

The most versatile vertical turret lathe available to the metalworking industry...

... Man-Au-Trol, Model 75



AVAILABLE IN SIX SIZES, 26" THROUGH 76" IN INCREMENTS OF 10".

Versatile because at the time of purchase should your production output require only a Cut Master V.T.L., Model 75 and later increase so that automatic operation is desirable, a Man-Au-Trol Conversion Unit can be added to the Cut Master *right in your plant.*

The Man-Au-Trol Conversion Unit directs the machine through all the functions the machine is capable of performing — automatically — by use of control and function drums. Machine down time for job change-over is reduced to a minimum since the control drum can be pre-set in advance and placed in the machine in a matter of seconds.

Your Bullard Sales Engineer will be glad to fully explain all of the technological advantages that are incorporated in the Man-Au-Trol, Model 75 and apply them to your machining problems.

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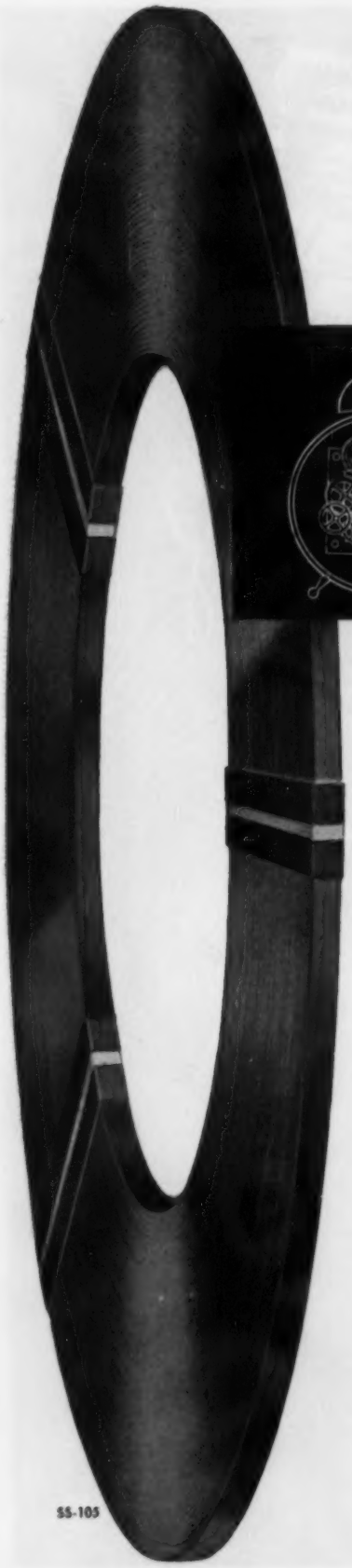

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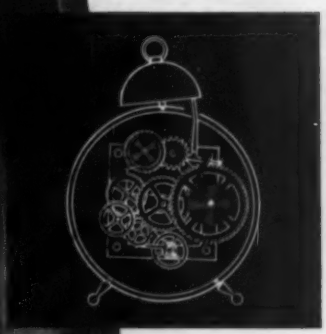

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If your product requires high fatigue life, fine surface finish, uniform physical properties and accurate gauge, try Sandvik.

You can get Sandvik strip steels:

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- **Polished bright, yellow or blue.**
- **With square, round or dressed edges.**
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Ask your nearest Sandvik office for further information or technical assistance.

FREE SANDVIK CATALOG: Gives thickness, width, hardness, type of edge and weight in pounds per hundred ft. Write for your copy.

SANDVIK SWEDISH SPECIALTY STRIP STEELS

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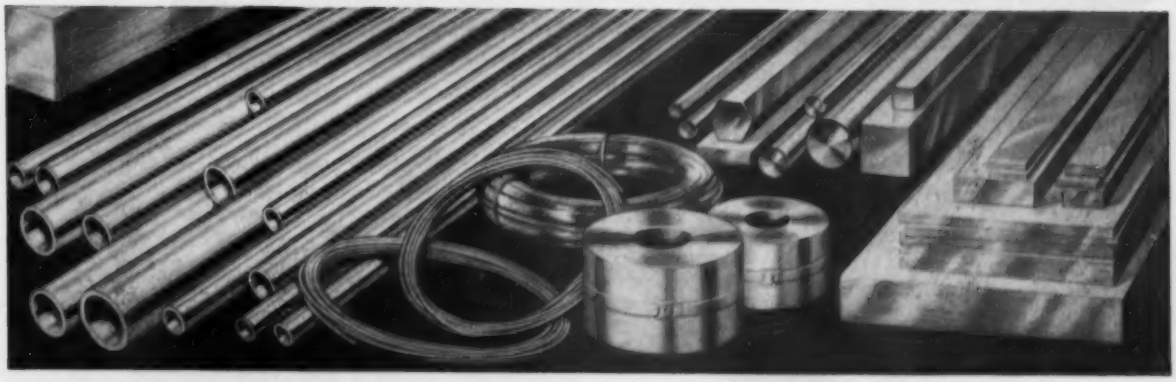

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For JOBBING VERSATILITY plus HIGH PRODUCTION

The Fellows 36-Type Gear Shaper has tremendous 'earning power'...whether used to handle virtually every job that comes up in a small gear department...or concentrated upon the heavy work in a large production shop.

A powerful, ruggedly constructed, heavy duty machine, the 36-Type can take heavy cuts at high speed . . . yet hold close limits. It features quick set-up, fast gear-shift change from heavy to fine feed, and simple dial adjustment from one cutter-spindle speed to another.

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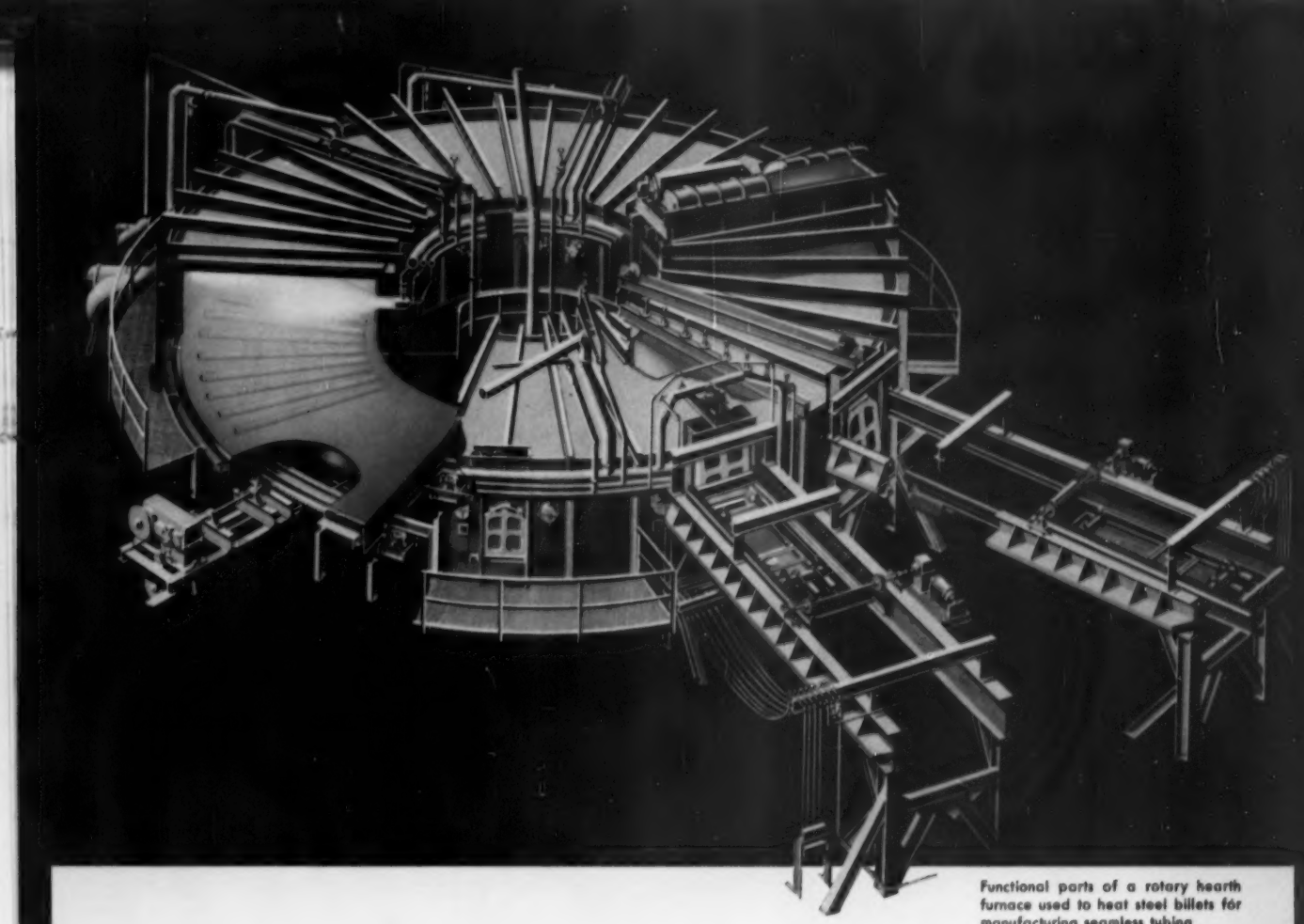
THE PRECISION LINE

Fellows Gear Production Equipment



Functional parts of a rotary hearth furnace used to heat steel billets for manufacturing seamless tubing

Increase Productivity, Save Space, And Cut Fuel Costs With Salem-Brosius Rotary Hearth Furnaces

Most large rotary hearth furnaces in the world have been designed and built by Salem-Brosius or its licensees. Salem-Brosius developed the large rotary hearth furnace and continuously has improved its design and construction.

Salem-Brosius rotary hearth furnaces are in use today for production heating and heat treating carbon and alloy steel bars, slabs, round and square billets, shell stock and forging stock; and similar products in non-ferrous metals such as copper and brass.

The rotary type furnace saves floor space. Fuel efficiencies and economies are unequalled by any other type of industrial furnace. Heating is rapid and uniform. Charging and discharging is mechanical; and automaticity of control drastically cuts labor costs. A Salem-Brosius rotary hearth assures the minimum of maintenance and repair costs. These benefits spell higher furnace output, less downtime, lower production cost—and greater profit to you, the user.

The rotary hearth is but one of the many types of Salem-Brosius furnaces—furnaces of superior design and construction—furnaces that help improve your product and turn it out at a lower cost. If your plant modernization plans call for heating or heat treating furnaces of any kind, call on Salem-Brosius.

Other Salem-Brosius products include forging manipulators, furnace charging and discharging equipment, hot materials handling equipment, large gas main valves, blast furnace clay guns, and a long list of special machinery and auxiliary furnace equipment. A Salem-Brosius engineer will be glad to help you with problems involving any of this equipment, or any special equipment that must be tailored to your needs. Write to us.

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In DSC High "C" Spring Steel (carbon content over .25% min. to 1.05% max.) you get the working properties of DSC STRIP. For example, close gauge tolerance, uniform temper and bright or satin finish—all depending upon your job requirements.

In addition, DSC High "C" Spring Steel gives you "*response-ability.*" You can have the strip hard rolled untempered or spheroidized annealed. In that case, you heat treat your own "*response-ability*" or springiness into the part after it's formed.

The carbon content tells only part of the story. Just as important is the particular way we cold reduce the steel—and when the job calls for it, the particular way we anneal it.

How we make the steel doesn't really matter. The important thing is whether we can give you what you need, when you need it.

With this in mind, how about talking over your High "C" requirements with your nearest DSC Customer Representative? We'll welcome the chance to work with you . . . and that goes for any of our products whenever we can be helpful to you.

*HIGH "C" ROLLING RANGE
GAUGE—Up to about .156" (depending upon the analysis)
WIDTH—Up to about 22" (depending upon gauge)
TEMPERS—Hard Rolled Untempered or Spheroidized Annealed
FINISH—Satin or Bright
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Customer Satisfaction is our No. 1 Job

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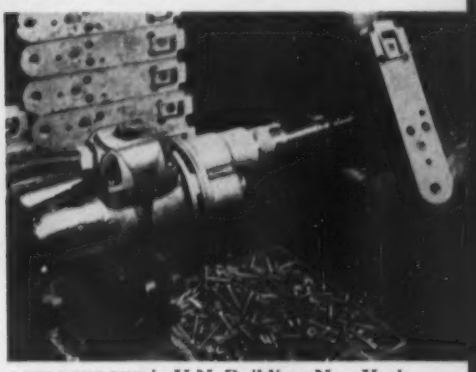
TEN IN THE TOP. 10 Phillips self-tapping screws hold top panel to the frame of the Fedders ¾ ton room air-conditioner. "We found employees on the assembly line are the best salesmen for Phillips screws," says the assistant plant manager. "Rapid driving of the screws is important to them because they are on piecework."

STEADY ON THE STABILIZER. Here is the final assembly of the top cover of a horizontal stabilizer at Republic Aviation. The purchasing agent said, "You can really foul it up with one of those speed guns if it slips out of the screw slot, but the Phillips type head helps to prevent slipping. It holds on to the driver bit much better than the old-type screw."



5,000 WINDOWS in U.N. Building, New York City, have Caldwell clock spring sash balances. "We depend on the worker's adjustment of the Phillips head screw to make the balance function perfectly," says Caldwell's production manager. "We now use two sizes of Phillips recessed-head screws . . . and have speeded assembly. Our power drivers are mounted horizontally, since we discovered the units are easier to move around than the drivers."

NEW DISCOVERIES IN ASSEMBLY

Many manufacturers in many fields are finding Phillips Cross-Recessed-Head Screws lead to better methods and results

Allmetal Screw Products Company, Inc. • American Screw Company • Atlantic Screw Works, Inc. • The Blake & Johnson Co. • Central Screw Company • Continental Screw Company • The Eagle Lock Company • Elco Tool and Screw Corporation • Great Lakes Screw Corporation • The H. M. Harper Co. • The Lamson & Sessions Company National Lock Company • The National Screw & Manufacturing Co. • Parker-Kalon Div. General American Transportation Corporation • Pheoll Manufacturing Company Rockford Screw Products Company • Scovill Manufacturing Company • Shakeproof Division Illinois Tool Works • The Southington Hardware Manufacturing Company Sterling Bolt Company • Universal Screw Company • Wales-Beech Corporation

MANUFACTURERS OF PHILLIPS CROSS-RECESSED-HEAD SCREWS

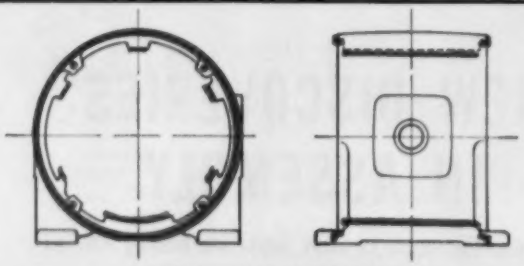
THE FASTENERS OF TODAY ... AND OF THE FUTURE

X marks the spot

... the mark of extra quality

PROBLEM

1. lower stator frame machining costs.
2. increase production and accuracy
3. run any one of four different size parts



MACHINING NECESSARY

Drill 8 holes	Bore two inside diameters
Chamfer 8 holes	Rough face ends
Tap 8 holes	Remove chips

for problems in Drilling, Boring, Facing and Tapping

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30 ESTIMATED GROSS PRODUCTION
PARTS PER HOUR
(ANY ONE OF FOUR DIFFERENT SIZE PARTS)

OPERATIONS

STATION No. 1
Load 1 part.
STATION No. 2
R. H. Horizontal Head
Combination rough bore for 10.492/10.490 half thru, rough bore for 12.064/-12.062 diameter, finish bore 10.520/10.510 diameter and rough face end.
L. H. Horizontal Head
Drill 4 holes

STATION No. 3
Idle
STATION No. 4
R. H. Horizontal Head
Drill 4 holes
L. H. Horizontal Head
Combination rough bore for 10.492/10.490 diameter rough bore for 12.064/12.-062 diameter and rough face end.

STATION No. 5
Idle
STATION No. 6
R. H. Horizontal Head
Tap 4 holes
L. H. Horizontal Head
Tap 4 holes
STATION No. 7
Idle
STATION No. 8
R. H. Horizontal Head
Idle
L. H. Horizontal Head
Finish bore to 10.492/10.490 diameter thru.
STATION No. 9
Blow chips out of center bore and 8 tapped holes (4 each side) and blow chips off top.
STATION No. 10
Unload 1 part. Part to be unloaded onto gravity conveyor.

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NATIONAL AUTOMATIC TOOL COMPANY, INC.

RICHMOND, INDIANA

Pep up the office staff with new

...AND GIVE YOURSELF A NEW LOOK,

STANDARD ALL-PURPOSE MODEL—with new lower, more comfortable 29-inch height. Ideal for both executives and other personnel.

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SECRETARIAL MODEL—has disappearing typewriter shelf in left- or right-hand pedestal. Designed for the utmost in convenience and loaded with attractive features.

Keep pace with the increased requirements of today's office procedures—and inject a fresh note of enthusiasm in staff morale—by modernizing your entire operation with beautiful new all-steel Republic Office Equipment.

You'll gain floor space, improve efficiency, increase job satisfaction—and at the same time enhance your reputation as a progressive, up-to-date organization in the eyes of clients, customers—*and prospective employees.*

This big prestige line manufactured by Republic's Berger Division includes matching executive, clerical, secretarial and special-purpose desks—plus tables, desk-high cabinets and other accessories—all smartly styled to combine maximum efficiency with good looks.

"Eye-Comfort" tops cut down eye strain and fatigue. Drawers slide smoothly and silently on long-lasting nylon glides—will not stick or bind because Berger's all-welded steel construction assures absolute rigidity. And the handsome Executive Conference Desk provides an extra-big top size for time-saving meetings right at your desk—plus many other important features.

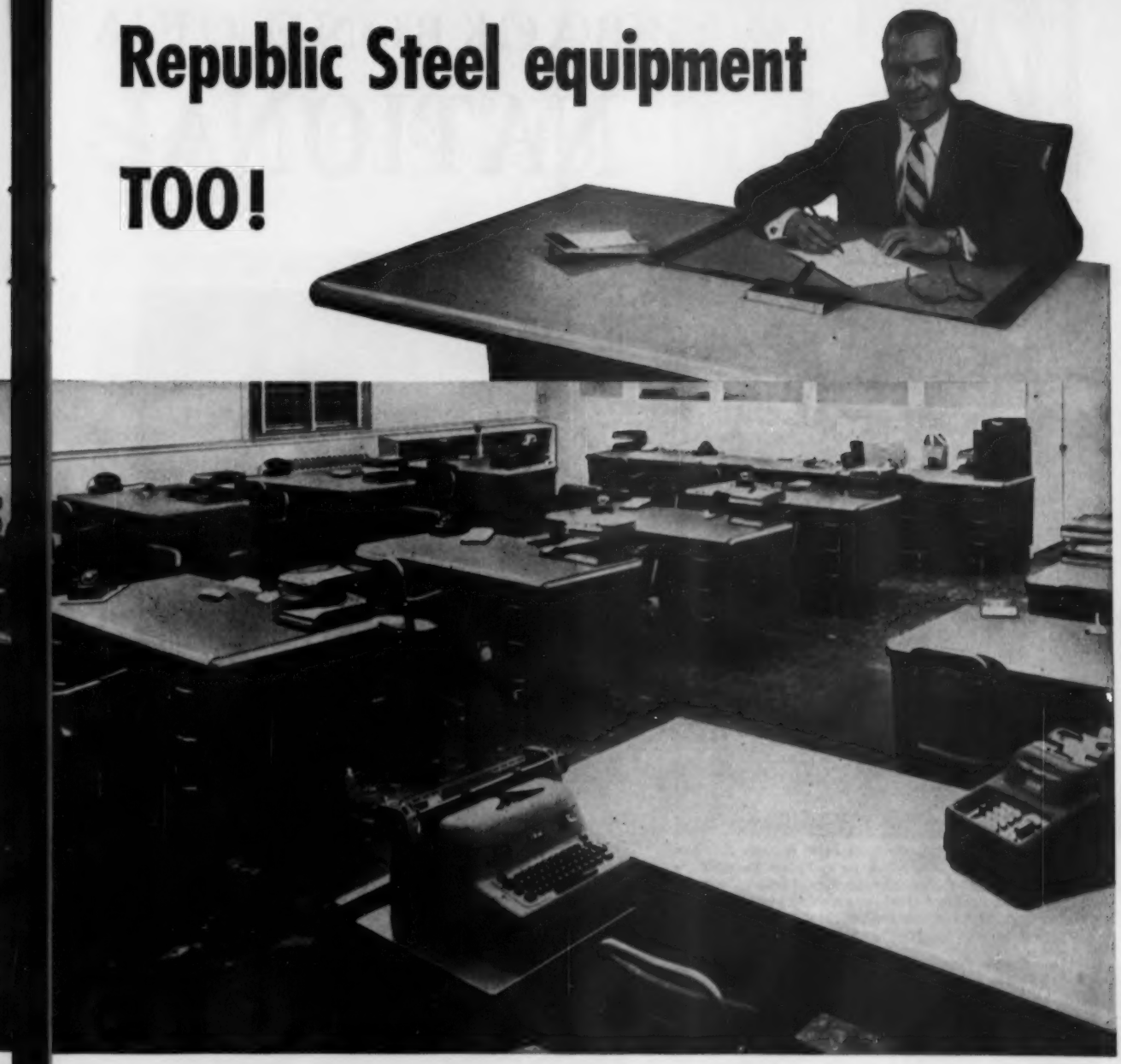
Standard on all equipment are two distinctive new colors—sahara beige and willow green—both keyed to the most modern decorating. Also your choice of other finishes—platinum grey, walnut and mahogany grains.

See the big Republic line on display at your Republic office furniture dealer's showroom. Or send coupon for illustrated literature and color samples.

ELIMINATE FILING FATIGUE with these smoothly operating Berger Vertical Steel Files. Drawers glide effortlessly on progressive ball-bearing roller suspensions. Super-rigid, all-welded lifetime construction assures no binding, sticking. Cabinets come in an array of finishes to match Republic Office Furniture. Available in letter, legal, ledger, jumbo, X-ray film, tariff and various card sizes—with or without automatic lock. Send coupon for literature.

WHERE LOCKER SPACE IS LIMITED—these handsome two-person "Spacesaver" lockers provide facilities for two people in the floor area required for one large individual single-tier locker. Upper compartment is locked simultaneously with lower by special inner-locking device. Berger, long a leader in the manufacture of lockers, makes all types and sizes for every requirement. For details send coupon.

Republic Steel equipment TOO!



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THE TOUGH SWEENEY POWERENCH has geared action for tightening or loosening nuts on dual wheels, aircraft propeller shafts, diesel engine cylinder heads, etc. The strength, uniformity, and dimensional accuracy of Seamless Tubing make it ideal for the manufacture of these rugged tools.

NATIONAL SEAMLESS PIPE AND TUBES are available in 25 different steel analyses—each designed to combat specific refinery problems such as oxidation, exposure, temperature, etc. Other chemical compositions are also available in tubular products, and a wide variety of high temperature problems are now under study.

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Seamless Pipe and Tubes

Whether you are manufacturing heavy-duty lug wrenches or erecting vast refineries, you'll want pipe and tubes that possess great strength . . . insure long life and complete dependability. In short, you'll want USS NATIONAL Seamless Pipe and Tubes.

NATIONAL Seamless combines to the highest degree the desirable qualities of strength, safety and workability. Uniform throughout and dimensionally accurate, NATIONAL Seamless Pipe and Tubes machine cleanly, weld readily, and promise smooth installation and long satisfactory service. Available in a complete range of steel analyses, wall thicknesses and diameters, every foot of NATIONAL Seamless is produced to exacting standards by the world's largest manufacturer of tubular steel products.

Bring your pipe and tubing problems to National Tube. Regardless of the application, our engineers are interested in discussing the problem with you.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.

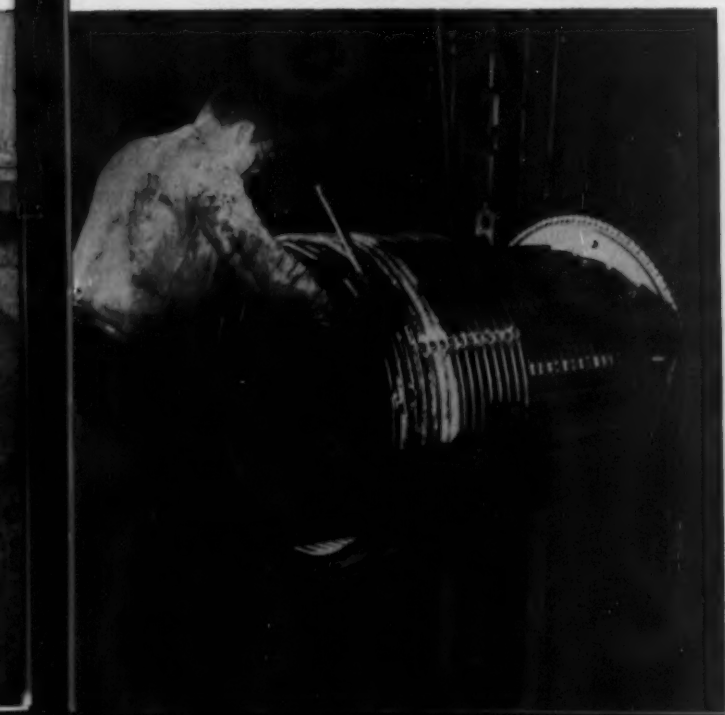
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS UNITED STATES STEEL EXPORT COMPANY, NEW YORK

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

USS National Seamless Pipe and Tubes

UNITED STATES STEEL

POWER UNITS AND HEAT TRANSFER EQUIPMENT call for thin-walled, smooth-surfaced tubes that offer the *least* resistance to the flow of heat, yet the maximum resistance to pressure. One material possesses the ideal combination of properties for this type of service—Seamless Steel Tubes.



MASTS AND BOOMS OF NATIONAL SEAMLESS are widely used by the shipbuilding industry because they are extremely strong and rigid, yet comparatively light—easy to raise and maneuver. Their swaged and shrunk joints prevent slipping or telescoping.

This is a fast

Every hour, this Newton Vertical Rotary roughs and finish mills the tops of 600 aluminum pistons at 85% efficiency.

The machine automatically clamps, unclamps and ejects the finished pistons onto a conveyor. All the operator does is load!

A Newton Vertical Rotary is more than a machine tool—it is a method—the fastest known method of milling the flat surfaces of repetitive pieces!

CONSOLIDATED MACHINE TOOL

A DIVISION OF FARREL

one!

For aluminum milling, Newton Vertical Rotaries have high speed Vee belt drives and feeds up to 100 inches per minute

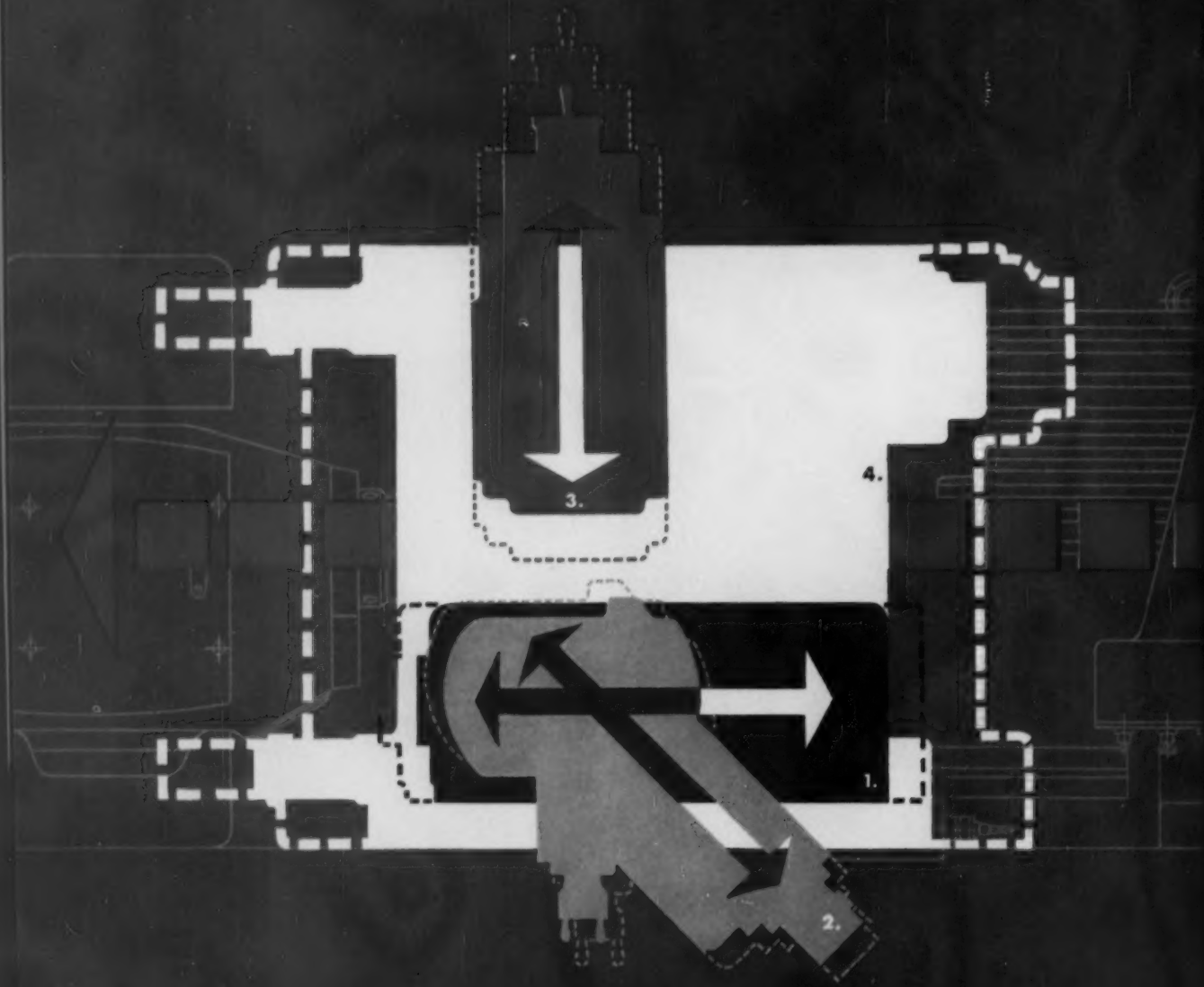
COMPANY, ROCHESTER 10, N. Y.

FJB

BIRMINGHAM CO., INC.

ACTION That's the Word for Hydra-Slide!

ARROWS SHOW SLIDE MOVEMENTS OF MONARCH'S NEW AUTOMATIC CYCLE CHUCKING LATHE



1, 2. Basic unit, most models—hydraulically operated front slide unit, on which is mounted famous Monarch Air-Gage Tracer. Utilized generally for straight or contour turning, facing, or boring.

3. Hydraulically operated rear slide unit for necking and grooving—is ideal with proper tool setting for facing, for which hydraulic automatic tool relief is provided.

4. Platen with hydraulic movement, on which both front and rear slide units are mounted. Speeds cycle for work piece change!

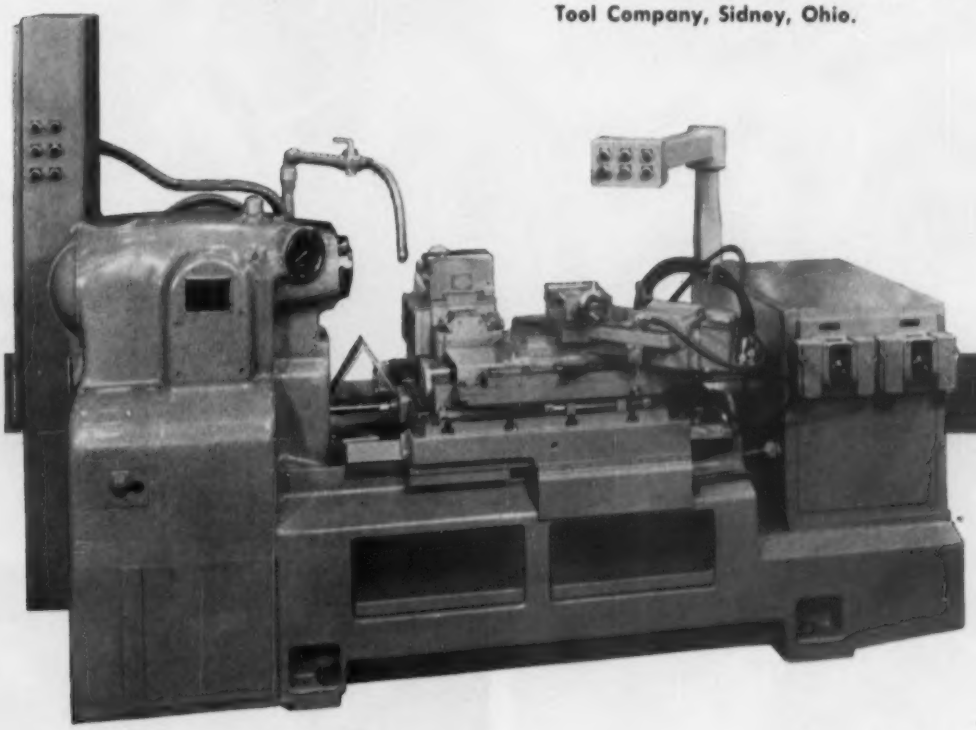
MOTOR FACTS ON INDUSTRY'S

HERE'S ACTION in the fight against rising production costs—with a fully automatic cycle controlling an extremely effective combination of hydraulic slide movements. Look them over! Here's an exceptionally versatile, high production chucking lathe for both first and second operation work.

Although the typical cycle presumes a tool or tools on both front and rear slides, and is based on the ideal production-wise situation of simultaneous operation of slides—the versatility of the machine is such that many variations can be set up. Of course, there are convenient all-electrical controls for effortless and positive setup.

The Hydra-Slide has ample capacity as to work size and stock removal both, with work diameter capacity up to 15" over front slide unit —up to 13" over rear slide unit—and work drive motor ratings up to 20 H.P.

Here's action—production-wise and cost-wise! You should know *all* about a machine like this. Send the coupon today for our complete illustrated booklet #1703—**The Monarch Machine Tool Company, Sidney, Ohio.**



The Monarch Hydra-Slide. Front Slide, with Air-Gage Tracer, provides smooth, stepless cut for multiple diameters, tapers, faces, radii and chamfers with single-tool economy. One or more tools on rear unit neck, groove, form cut, and face. Both mounted on platen. Send coupon for complete story.

Monarch
TURNING MACHINES
FOR A GOOD TURN FASTER . . . TURN TO MONARCH

THE MONARCH MACHINE TOOL COMPANY
SIDNEY, OHIO

Please send me your illustrated booklet #1703 on the new Monarch Hydra-Slide.

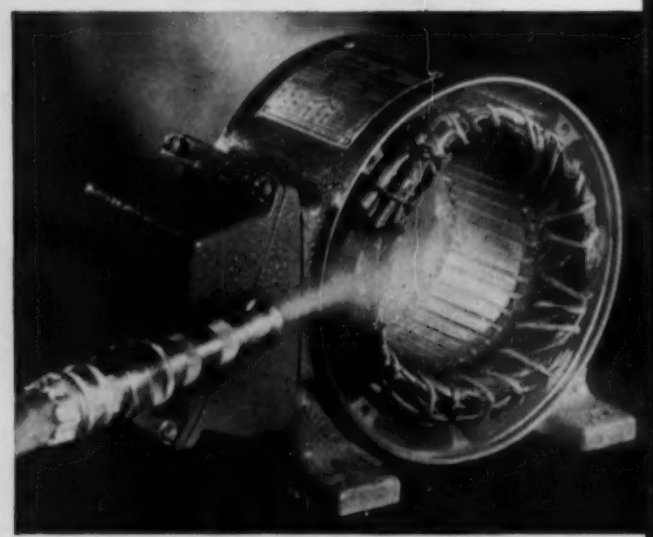
NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

MOTOR FACTS ON INDUSTRY'S
MOST PREFERRED "POWER PACKAGE."



Electrical System Fact—New exclusive Bondite impregnating varnish, partner to new Bondar and Mylar* insulations, guarantees complete resistance to weather. It doesn't just repel, it resists—all the way through.

*Du Pont Registered Trade-Mark

FACT:

The new Life-Line A is the most weather-resistant motor on the market

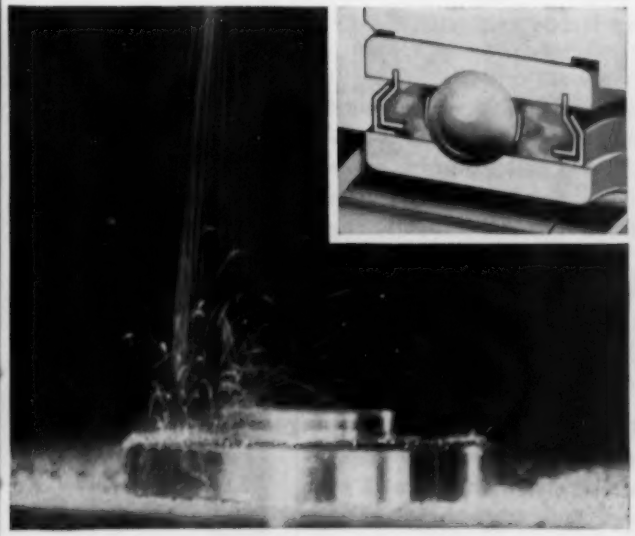
Whether your application is hot—cold—wet or dry, you'll find the new Westinghouse Life-Line® "A" motor will last longer under more extreme weather conditions than any other motor you can buy.

New insulation materials, housing designs, 4-way sealed bearings are tangible evidence of electrical, mechanical and lubrication system improvements that make Life-Line "A" industry's most preferred package of power.

Get all the facts by calling your Westinghouse sales engineer . . .
The Man With The Facts.

J-21882

YOU CAN BE SURE...IF IT'S
Westinghouse



Lubrication System Fact—Two outer seals of new 4-way sealed bearing act as flingers and literally (see photo above) throw off damaging contaminations. Inner seals, attached to outer bearing race, are stationary and form a positive labyrinth with outer seals.

Mechanical System Fact—New exclusive air by-pass on totally-enclosed motor permits the motor to breathe around the bearing—not through it—minimizing atmospheric damage. Finest grained castings used in new cast-iron housings.

FLEXIDYNE

THE DRY FLUID DRIVE

DODGE of Mishawaka Announces An Entirely New Development in Industrial Power Drives that Promises to Revolutionize Drive Performance! Every Design Engineer and Plant Operating Man in America Will Want the Following Information.

Here are the facts on how easily Flexidyne handles difficult starting problems, and gives a *new* kind of protection against shock and overloads.

While new in the United States, this drive has already been proved in thousands of installations in Europe. Dodge has redesigned it to American standards and now makes its dramatic advantages available to all industry.

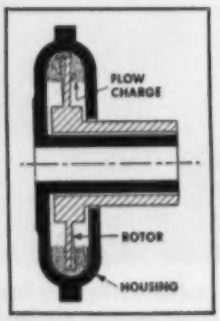
Flexidyne is a *dry fluid drive.* Its advantages over any other fluid-type drive are based on the fact that at normal operating conditions it *does not slip.*

WHAT IT IS

The Flexidyne Drive is made up of a housing, inside of which a rotor is free to turn concentrically. Between the two are fine particles of spherical steel shot, called the "flow charge," which acts very much like a fluid. The flow charge transmits power from housing to rotor.

This flow charge is easy to seal in, has a high density and can stand relatively high temperatures. The use of this flow charge makes possible a design that is simple, compact, economical, and gives outstanding new and different operating characteristics.

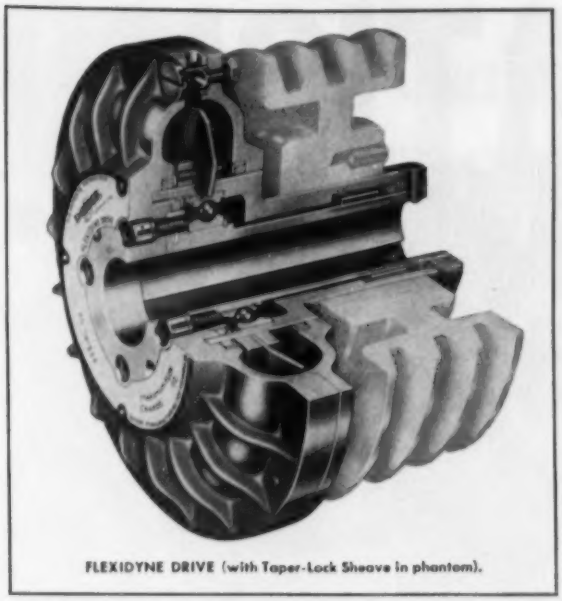
HOW IT WORKS



1. The motor is connected to the housing, and starts it turning at no load.

2. The flow charge is thrown to the circumference of the housing, is compressed by centrifugal force, and revolves with the housing.

3. The rotor, connected to the load, is started and accelerated by the friction and wedging action of the revolving flow charge.



FLEXIDYNE DRIVE (with Taper-Lock Sheave in phantom).

4. Rotor and housing reach identical speeds—the Flexidyne operates with ZERO SLIPPAGE between motor and load at normal running speeds.

5. Before overloads cause damage, the Flexidyne rotor slips relative to the housing, overcoming the friction and wedging action of the flow charge. A thermal switch (optional) automatically cuts the electrical circuit if an overload persists.

6. The amount of the flow charge determines the torque capacity.

WHAT IT DOES

The Flexidyne gives you the *exact* starting torque you need, for anything from the smoothest to the fastest start. Once the load reaches normal speed, there is zero slip, giving 100% efficiency. Also, it provides *accurate* overload protection, as it can be set to slip at any desired load. During starting and overload periods the current draw is at a minimum because with the standard Flexidyne setting the motor is never pulled down to less than 90% of synchronous speed.

All this is due to Flexidyne's completely new principle, which produces *constant torque* for a given input speed, regardless of the percentage of slip between the rotor and housing (which occurs only during starting or overload).

The Flexidyne is simple to select *off the shelf.* Each size has a standard horsepower rating and yet it is only a matter of minutes to vary the flow charge to give you your own *tailor-made torque* to suit the job.

With Flexidyne you get *uniform* performance regardless of changes in the surrounding temperature.

The Flexidyne has very long life and practically negligible maintenance. *Its simplicity guarantees its dependability.* Gas and diesel engines also benefit from all Flexidyne advantages.

Aside from Flexidyne's low first cost, low maintenance, and top efficiency, it permits the use of smaller, cheaper motors and controls with greatly reduced current demands and improved power factor. Its *smoother* starts and *gentler* overload protection avoid breakage and reduce maintenance on drives, gears, bearings and driven machinery.

FLEXIDYNE COUPLINGS

Two lines will be available—*Flexidyne Drives,* for convenient mounting directly on motor shafts and adapted for Dodge Taper-Lock Sheaves, and *Flexidyne Couplings* with Taper-Lock Bushings, for straight line drives. Several thousands of these units of French design, in capacities ranging from fractional to thousands of horsepower, are now in use in Europe. Dodge will first offer — from stock — four sizes rated at 3 to 30 hp at 1800 rpm. Other sizes will follow.

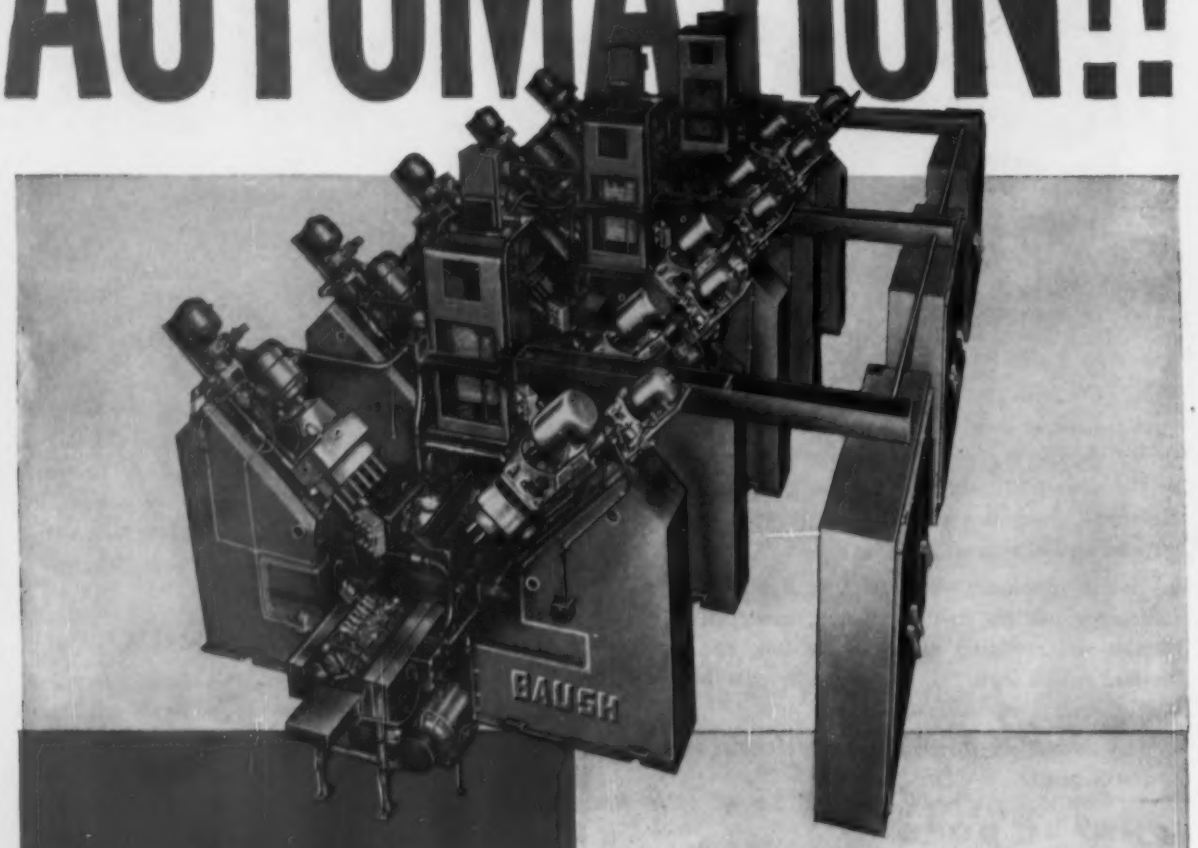
Write now for special bulletin, delivery dates and application information.

DODGE MANUFACTURING CORPORATION
800 UNION STREET, MISHAWAKA, INDIANA

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

DODGE
of Mishawaka, Ind.

AUTOMATION!!



BAUSH 6-Section Transfer
with 27 Stations
Automatically Performs
9240 Operations on
69 Automobile Cylinder
Blocks Every Hour!!!

BAUSH
MACHINE TOOL CO.
SPRINGFIELD 7, MASSACHUSETTS

Once again a leading automobile engine maker selects BAUSH TRANSFER EQUIPMENT for efficient and economical production. Noted for their sturdy construction BAUSH TRANSFERS give day-in and day-out production with the very *minimum* of "down time" for maintenance.

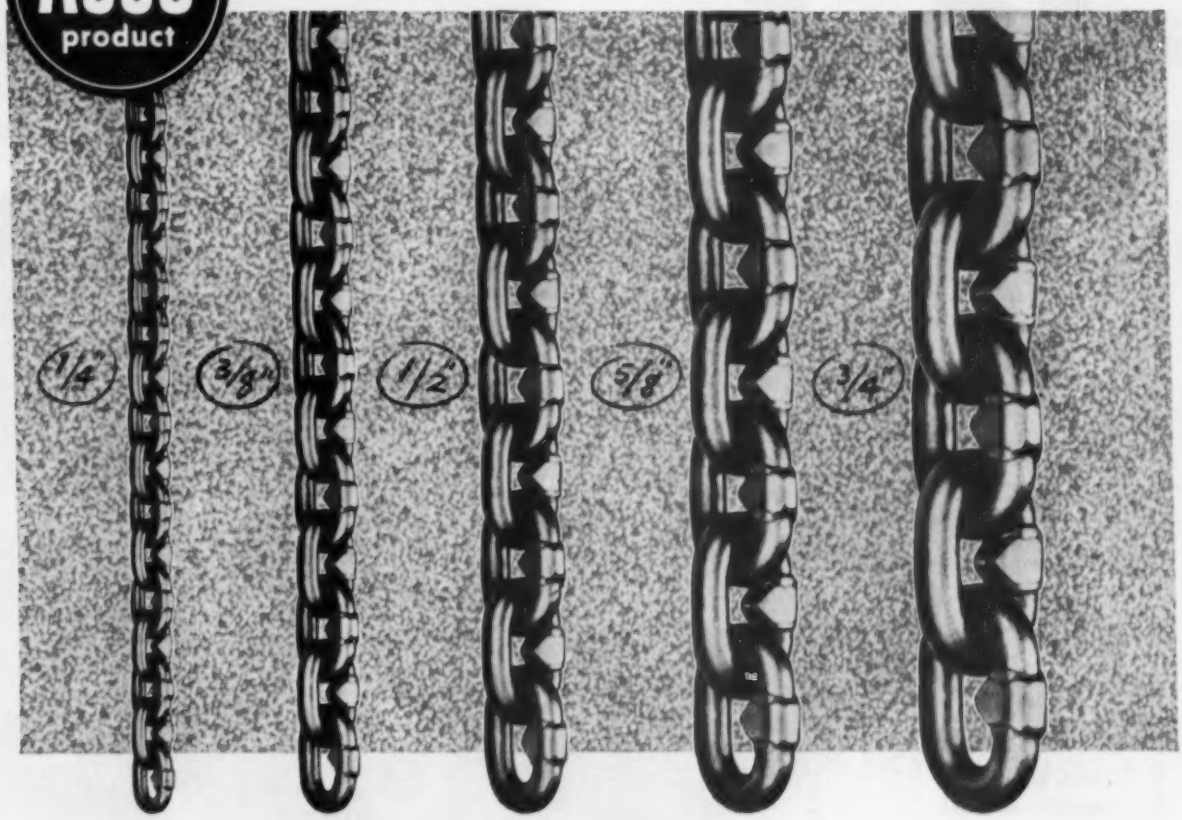
This transfer has thirty (30) Baush Model "S" Mechanical Leadscrew units with 18" max. stroke — arranged and mounted on individual columns in vertical, vertical angular and compound vertical angular positions for various operations. It has —

1 Load Station — 12 Work Stations
2 Roll-over Stations to dump chips
11 Idle Stations for ease of tool change or maintenance
1 Unload Station.

Blocks mechanically transfer from station to station and locate and clamp hydraulically at each work station. A total of 134 spindles, drill, chamfer, ream, mill, core-drill and counterbore 69 V-8 Cylinder Blocks every hour at 100% efficiency.

an ACCO product

The Chain that Identifies Itself-



PATENT APPLIED FOR

ACCOLOY X-WELD 125 is available in 5 sizes

This link was ground and etched to show its big welded area —2¼ times conventional size area. This means double the security at the weld

• The sensational new **Accoloy X-Weld 125** chain stands out distinctively and is a leader among quality chain. Its unique link formation, with the king-size welded area, identifies it instantly.

Welds with these alloy lugs are as strong or stronger than the alloy material—and they won't break when links are bent. Kinking is prevented by the projecting lugs—chain hangs straight as a die!

Accoloy X-Weld 125 chains are available *now* in five sizes—¼", ⅜", ½", ⅝" and ¾". Use them for slings, towing, bundling, general utility jobs. Write our York, Pennsylvania office for **Bulletin DH-319.**

ACCO

American Chain Division
AMERICAN CHAIN & CABLE

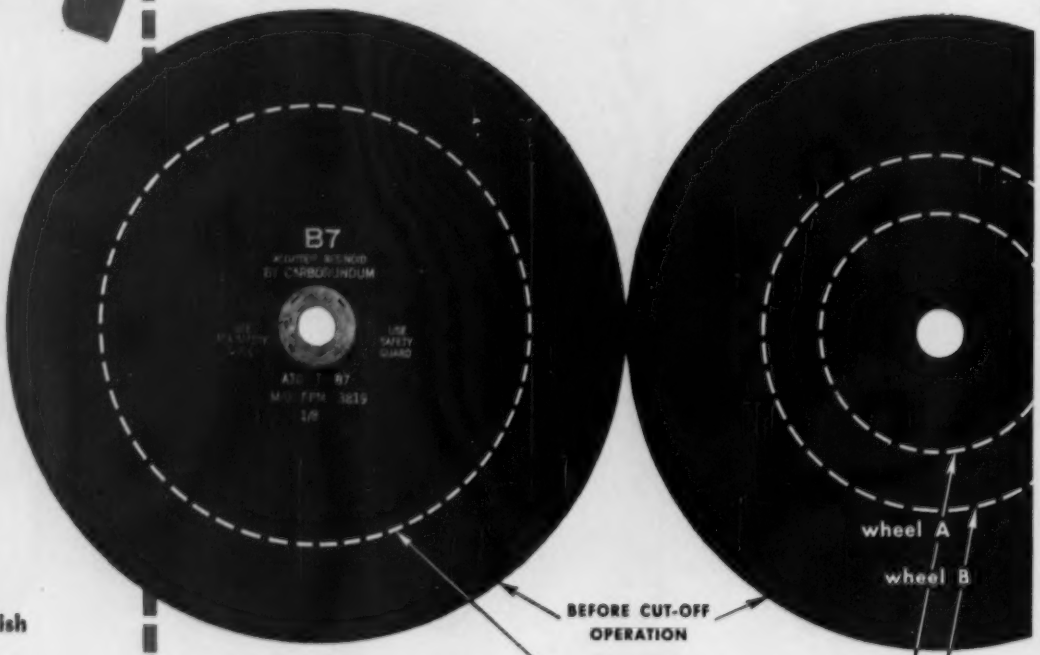
York, Pa., Atlanta, Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

Better Value

B7 NEW BOND TYPE

★ **LONGER WHEEL LIFE**

with equal quality of finish

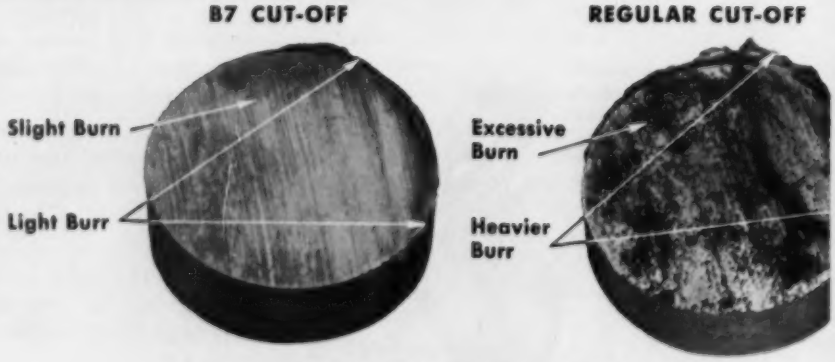


B7 BOND WHEEL

After same number of cuts, B7 outlasts Wheels "A" and "B" by 10-25%.

★ **BETTER QUALITY OF FINISH**

with equal wheel life



COLD ROLLED BAR STOCK, 1⅛" DIAMETER

...continually puts more SENSE in your abrasive DOLLAR

SETS NEW STANDARDS OF PERFORMANCE

FOR ABRASIVE CUT-OFF

WHAT ARE YOU LOOKING FOR in your cutting-off operations... freedom from burn and burr?... close tolerance accuracy?... high production?

Here's a revolutionary new bond type—B7—which is the finest combination yet developed to give you maximum work finish, maximum cut-off speed, and maximum wheel life.

Thousands of these new wheels have been job-proven on work just like yours. The B7 Bond Cut-Off Wheel is *another* CARBORUNDUM development. It's a wheel you'll use with profit!

PLUS NEW FEATURES

NEW distinctive wheel marking —for instant recognition

NEW simplified gradings —R, T, V grades only

NEW rough sides are standard— no need to specify RS on order

TRY ONE YOURSELF!

A simple demonstration in your shop, on any material you're cutting, will convince you that B7 Bond Resinoid Cut-Off Wheels will outperform any other wheels you can use. Call your Carborundum Distributor or salesman to arrange a time most convenient to you. He's listed in the yellow pages of your phone book under "Abrasives" or "Grinding Wheels."

CARBORUNDUM

REGISTERED TRADE MARK

AGAIN . . . LATHE LEADERSHIP FROM LODGE & SHIPLEY

15 | **NEW**

Powerturn LATHES

Exclusive new —

Computing

HEAD

. . . fast, fool-proof indication of correct speed settings!

Centri-trol

CONTROLS

. . . all controls conveniently grouped, distinctively shaped!

Turning problems into production is a built-in specialty of these New Lodge & Shipley POWERTURN Lathes. From headstock to tailstock..... and down to the floor..... POWERTURN Lathes are designed to facilitate turning to new, higher levels of profitable operation.

The many new features add importantly to Lodge & Shipley Lathe ability to produce more at lower cost.

New POWERTURN Lathes are produced in 13", 16", and 20" Standard Engine, Toolmaker, Gap, Manufacturing and COPYMATIC types.

Write for new literature on POWERTURN Lathes ..... newest and best from *The Lodge & Shipley Co., 3055 Colerain Ave., Cincinnati 25, Ohio.*

Features

- Positive brake
- Greater swing over cross slide
- Micrometer carriage dial
- New chip and coolant pan
- Redesigned feed levers
- Direct-reading cross and topslide dials
- Square base compound rest
- Built-in horsepower ammeter
- Front-mounted tailstock handwheel

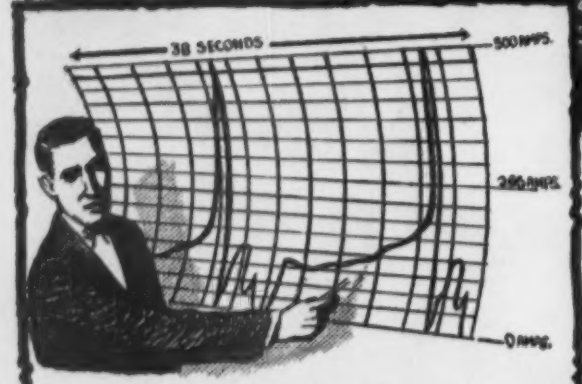
beyond the sonic wall...
thermal barriers
with, as yet,
unanswered
challenges!
• With each "boom" of a jet crashing through the sonic barrier, aircraft engineers give the sleeping dragon's tail another twist. Out there in space—which mankind has dedicated itself to conquer, lies the ugly, wallowing form of the next big challenge—temperature!
We manufacture many things for our air arm . . . precision gear assemblies for accessory drive units, actuators, transmissions, computers and controls . . . complete components such as bomb hoists, gun turrets, radar tracking and scanning assemblies, hydraulic actuators. But we're also hard at work on top secret equipment which, in the near future, will help arm our "flying St. Georges" as they slay the fiery dragon.
Challenges like these are our long suit. We've helped solve tough problems for years . . . and will keep on assisting wherever possible. Make your development and production problems our problems. Just write, wire or call: The Steel Products Engineering Company, Springfield, Ohio.
SPECO
THE STEEL PRODUCTS ENGINEERING CO.
ENGINEERS AND MANUFACTURERS • SPRINGFIELD, OHIO

FACTS ABOUT Exide®

IRONCLAD® INDUSTRIAL TRUCK BATTERIES

NO MOVING JOB IMPOSSIBLE!

STEEP RAMPS, LONG HAULS, HEAVY LOADS... NO JOB IS IMPOSSIBLE WHEN ELECTRIC TRUCKS ARE POWERED WITH IRONCLADS. EXIDE MAKES BATTERIES WITH ADEQUATE CAPACITIES TO KEEP TRUCKS WORKING FULL-SHIFT...WITH NO LET-DOWN IN TRUCK POWER OR PERFORMANCE. USER COST RECORDS SHOW THAT EXIDE-IRONCLADS ARE YOUR BEST POWER BUY— AT ANY PRICE!



PORTRAIT OF AN EXIDE WORKING

IN JUST TWO MOVES AND 38 SECONDS A FORK TRUCK MAY DRAW ENERGY FROM ITS BATTERY IN THIS PATTERN, IN RESPONSE TO 44 SEPARATE CONTROLLER OPERATIONS. IN AN 8-HOUR SHIFT, 3000 SUCH DEMANDS MAY BE MADE. EXIDE-IRONCLADS ASSURE RAPID, ACCURATE HANDLING OF MATERIAL... THEY RESPOND INSTANTLY TO THESE RAPIDLY RECURRING DEMANDS FOR HIGH POWER FOR SHORT DURATIONS.

TUBES OF POWER WORK FOR YOU INSIDE AN IRONCLAD

SLOTTED TUBES INSIDE AN IRONCLAD KEEP ACTIVE MATERIAL IN FIRM CONTACT WITH CONDUCTING GRIDS OF THE POSITIVE PLATE...THIS GRID PROTECTION LENGHTENS THE LIFE OF THE BATTERY. SLOTTED TUBES EXPOSE MORE ACTIVE MATERIAL TO THE ELECTROLYTE... FOR GREATER POWER. FINE TUBE SLOTS HOLD MATERIAL IN CONTACT WITH GRID LONGER...RESULT, THE IRONCLAD'S ABILITY TO DO YOUR MATERIALS MOVING JOB FOR A LONGER PERIOD OF TIME. THAT IS WHY EXIDE-IRONCLADS ARE YOUR BEST INDUSTRIAL TRUCK BATTERY BUY— AT ANY PRICE!

LET EXIDE HELP SOLVE YOUR INDUSTRIAL TRUCK BATTERY PROBLEMS. ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ❷ WRITE FOR FORM 1982, A MANUAL ON INSTALLING AND MAINTAINING MOTIVE POWER BATTERIES.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

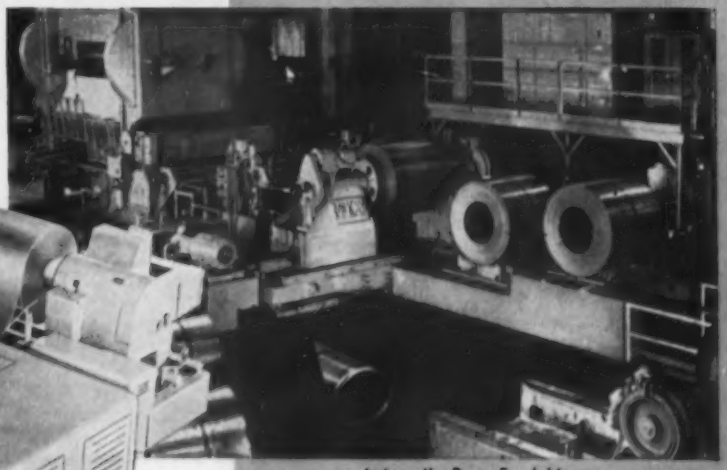
McKAY

Specializing in Automatic Steel Processing Machinery

THE NEXT DECADE will see more engineering and technical advancement than we have experienced in the last 25 years. This advancement will be due to the economic pressure on industry to continually reduce manufacturing costs. Cost reduction can only be accomplished by the invention of new processes or the development of new methods or the automation and mechanization of existing machines. Whether you require a single machine or a completely automatic line, you'll be wise to consult McKay, where progressive ideas are backed by 35 years of "on the job" experience.

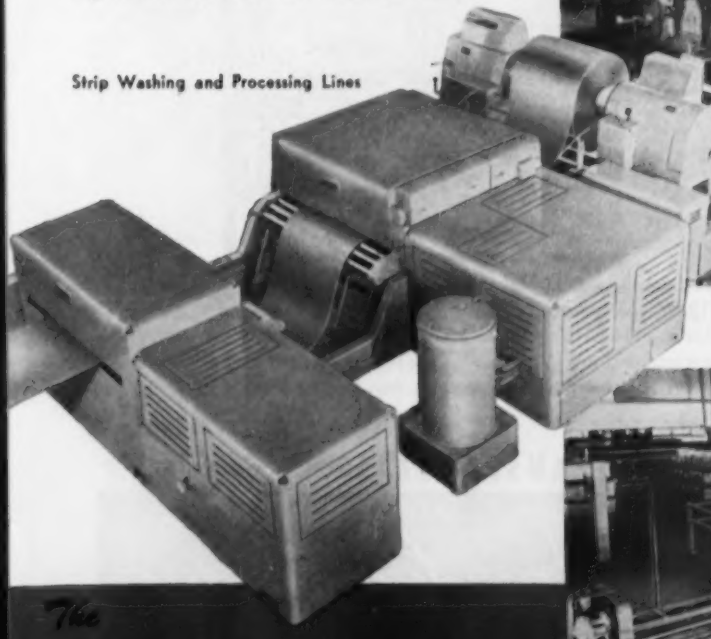
You'll find machines of the types pictured on these pages in current use in plants bearing America's foremost industrial names.

Automatic Cold Draw Lines



Automatic Press Feed Lines

Strip Washing and Processing Lines



Automatic Tube Cut-Up Lines

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR THE AUTOMOTIVE, FABRICATING AND STEEL INDUSTRIES

CLIFFS

...still produces the quality ore that constituted the... FIRST shipment through the 'Soo' in 1855

The Old "Soo" Locks in 1855

"WOODEN SHIPS AND IRON MEN" has become the watchword of the American Merchant Marine, Navy and Coast Guard since 1812. It was a wooden ship that carried the first shipment of ore through the Saulte St. Marie in 1855 bound for the lower lake ports. Since that time "Iron Men" have paced American industry in ore mining, steel making, and the great fleets of vessels that ply the Great Lakes which carry the ore that has made America industrially great.

IRON ORE ★ ALLOYS ★ VESSEL TRANSPORTATION ★ COAL

The Cleveland-Cliffs Iron Company

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

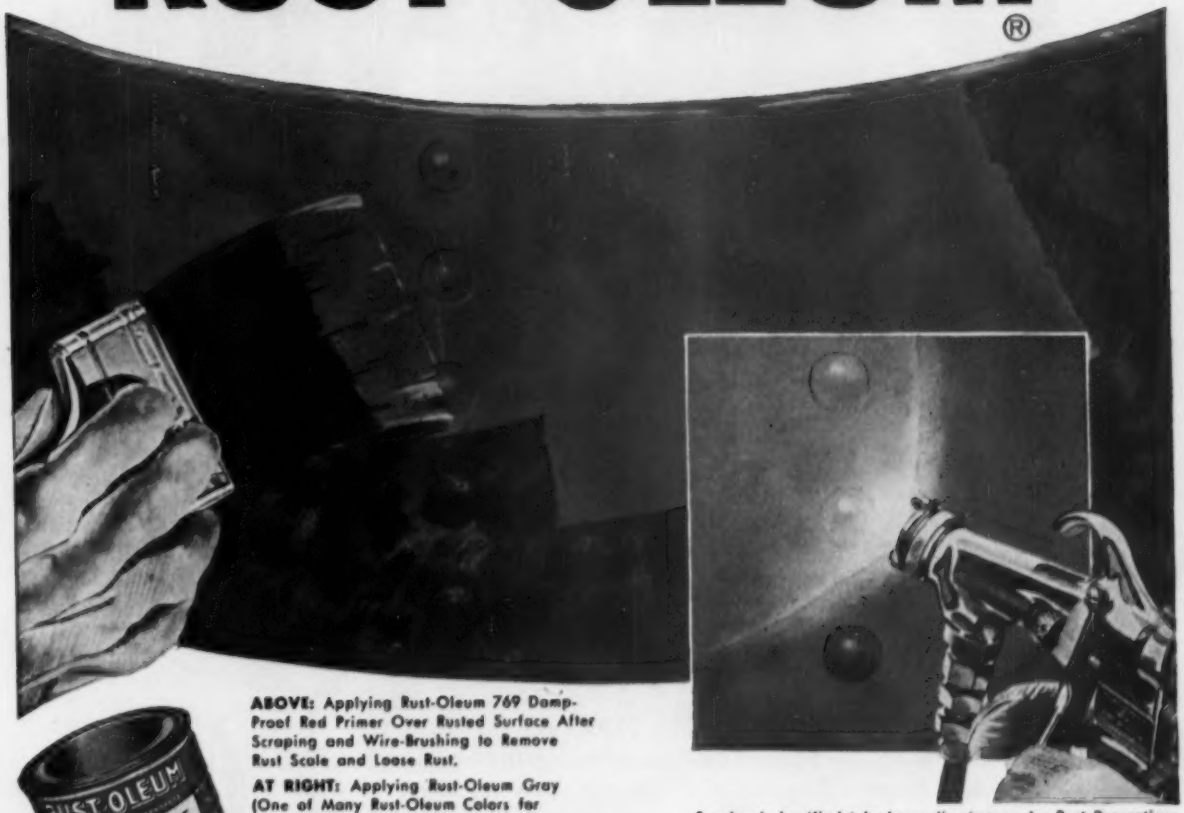
STOP RUST!

with

RUST-OLEUM®

Beautify As You Protect

Simply brush Rust-Oleum 769 Damp-Proof Red Primer directly over the rusted surface after scraping and wire-brushing to remove rust scale and loose rust. Rust-Oleum's specially-processed fish oil vehicle penetrates rust to bare metal—saving time, money, and metal! Then—beautify as you protect with Rust-Oleum's brilliant array of finish coatings. Specify Rust-Oleum for new construction, maintenance, and re-modeling. See Sweet's for complete catalog and nearest Rust-Oleum Industrial Distributor, or clip coupon to your letterhead . . . and mail today.



ABOVE: Applying Rust-Oleum 769 Damp-Proof Red Primer Over Rusted Surface After Scraping and Wire-Brushing to Remove Rust Scale and Loose Rust.

AT RIGHT: Applying Rust-Oleum Gray (One of Many Rust-Oleum Colors for Rust Prevention and Decorative Beauty).

There is only one Rust-Oleum. It is distinctive as your own fingerprint.

See local classified telephone directory under Rust Preventives or Paints for nearest Rust-Oleum Industrial Distributor.

ATTACH TO YOUR BUSINESS LETTERHEAD AND MAIL TO:
Rust-Oleum Corporation, 2563 Oakton St., Evanston, Ill.

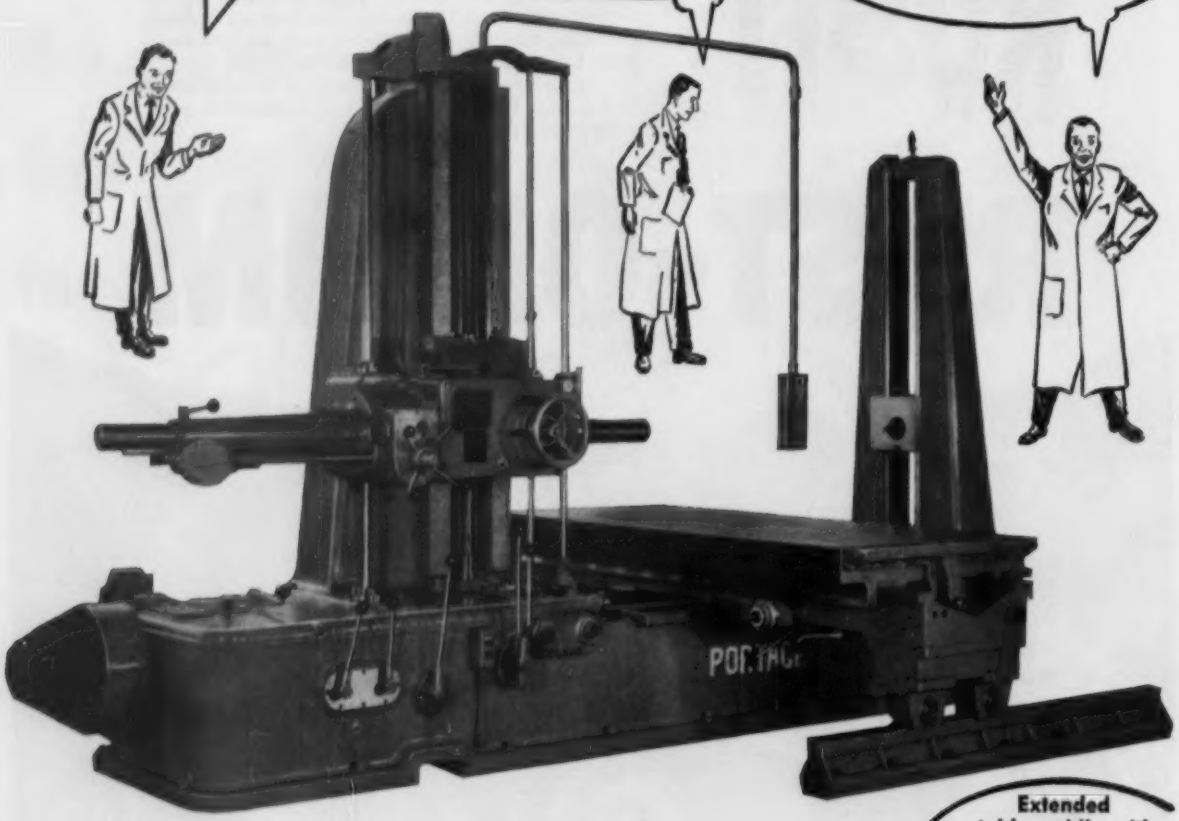
- ☐ Please Show Me the Rust-Oleum "Rusted Panel Demonstration."
- ☐ Test Application of Rust-Oleum Over Rusted Metal Surfaces in My Plant.
- ☐ Complete Literature with Color Chart.
- ☐ Nearest Rust-Oleum Industrial Distributor.

CHECK THESE *Features...*

4" spindle diameter, precision machined nitralloy steel.

Pendent controls include spindle rotation, forward, reverse, jog forward, jog reverse and stop.

36 spindle speeds 8-1000 R.P.M. 18 Feeds.



Extended table saddle with adjustable supports and runways makes it possible to handle the big jobs, too!

Unusually wide and deep base, cast entirely in one piece . . . offers excellent rigidity.

PORTAGE MACHINE PRICES START AT $31,358 COMPLETE. The PORTAGE Horizontal Boring, Drilling and Milling Machine is a precision built tool. Only the finest of materials and workmanship go into its manufacture . . . and at a comparatively lower cost. Get ALL the facts . . . write for literature and specifications . . . *TODAY.*

PORTAGE

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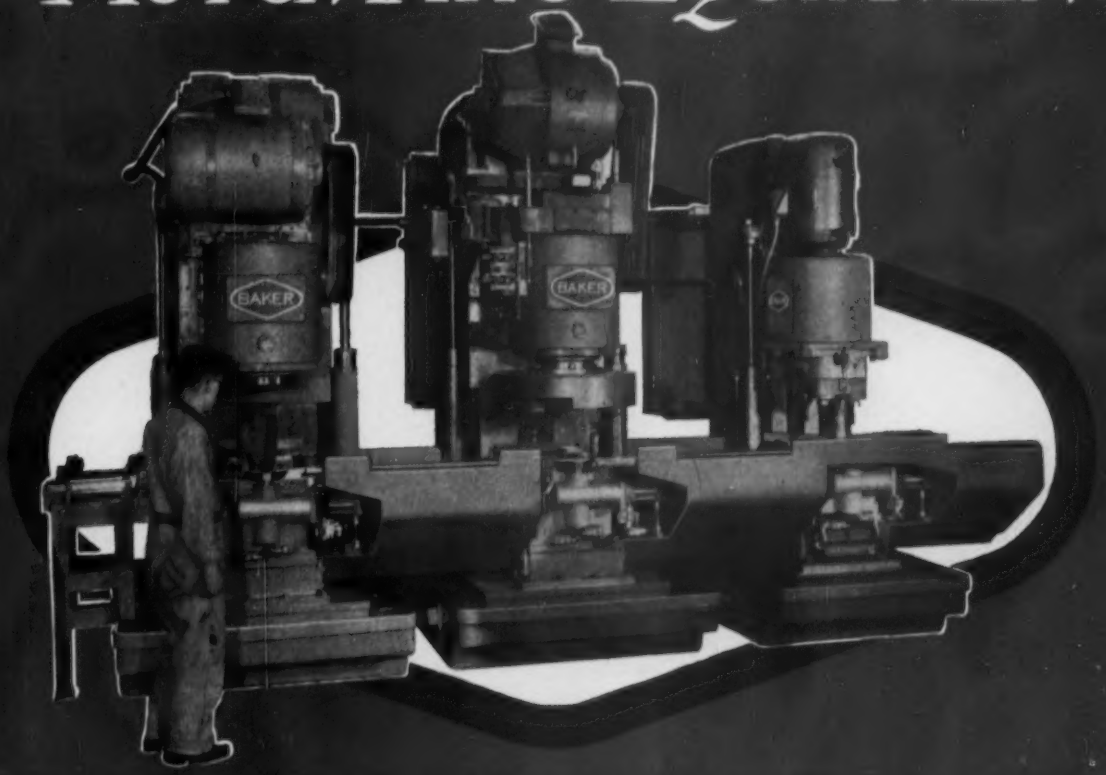

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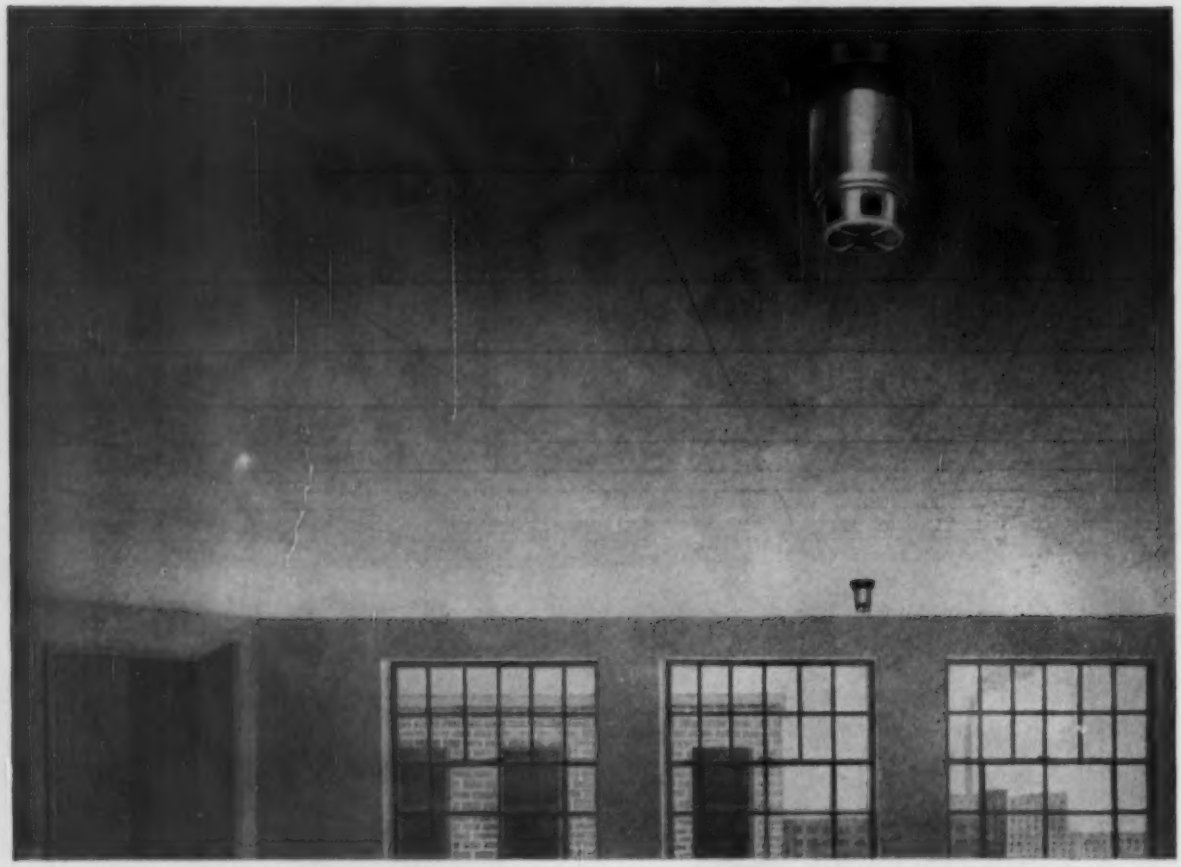

Each pre-detector head protects up to 3,600 square feet of area . . . harmless radio-active element utilizing ionization chamber principle quickly detects all forms of fire . . . requires only simple two-wire circuit and insignificant wall space for controls.

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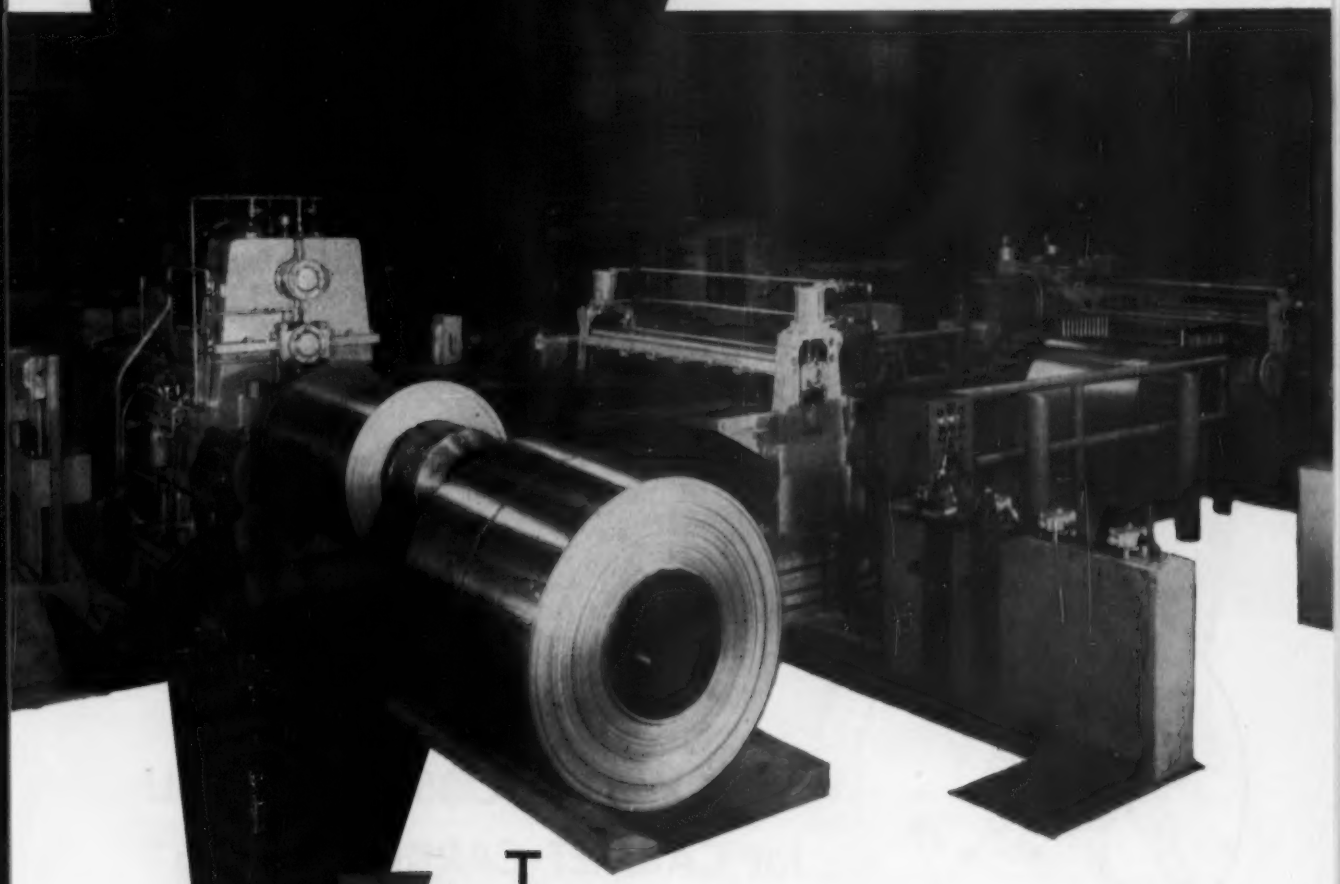

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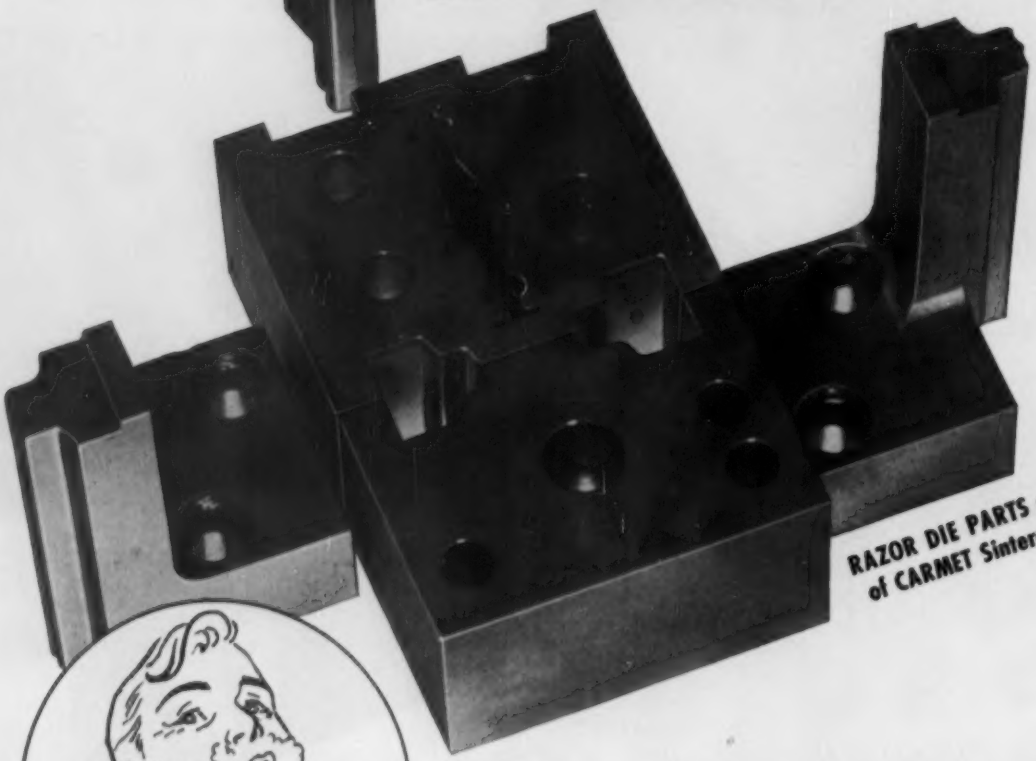

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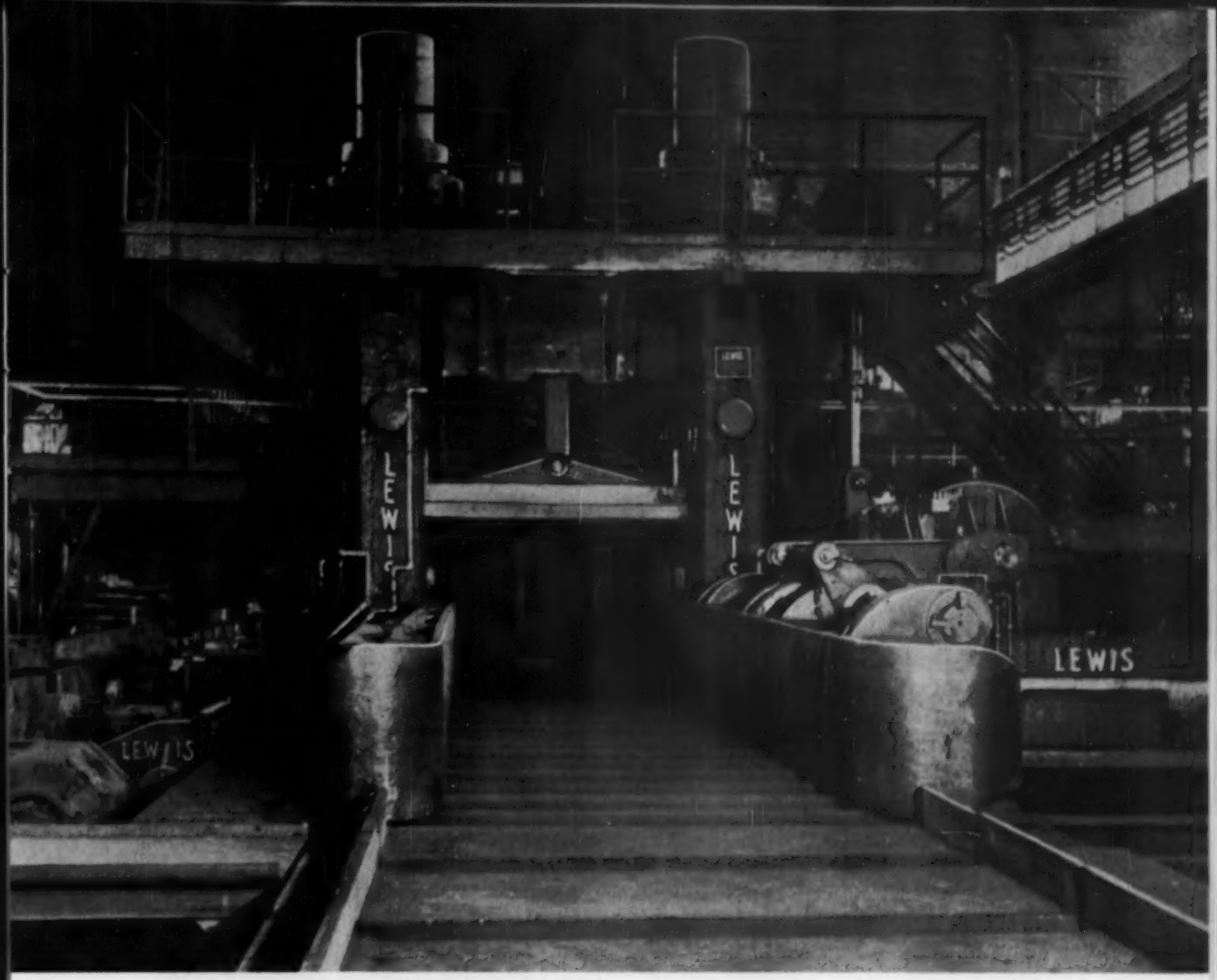

. . . roughing mill used in production of all standard structural shapes

This 36″ x 82″ Lewis two-high Hot Reversing Roughing Mill was designed and built for use in the production of standard structural shapes.

Although the rolls used in the mill are 36″ pitch diameter and 82″ body length, the large diameter collars needed for beam sections required windows 54″ wide—which is equivalent to those in the usual 44″ to 46″ mill. The cross sections of the sturdy housing posts are 425 square inches.

The mill is equipped with front and back mill tables, which have rack type side guard manipulators 28½″ high for handling the heavy beam blanks that come from a primary blooming mill. Six lifting fingers are provided on the one side guard on each side of the mill.

Driven by a 6300 hp, dc motor, this Lewis Mill can be reversed from 69 rpm forward to 69 rpm in the opposite direction in about two seconds.

Whether you may need a roughing mill of this type or some other kind of mill, our experienced engineers and modern manufacturing facilities are always available to design and build sturdy mill equipment to meet your specific requirements.

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LEWIS two-high Hot Reversing Roughing Mill

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Solve stainless welding problems

One example of many special Ryerson steels and services

For many years, fabricators have had trouble with carbide precipitation in welding and annealing stainless steels. Now, new Ryerson stocks of low-carbon stainless solve this long-standing problem.

A small part of Ryerson stainless stocks—the nation's largest

Two types are available for quick shipment from your nearby Ryerson plant—plates and sheets in Type 304L and Type 316L. (Sheets are available in 10 to 16 gauge inclusive. Plates from 3/16″ to 2″ in thickness.) Both types generally eliminate the need to anneal after welding—can be used in place of more expensive stabilized stainless when stress relieving is necessary.

With the addition of these new low carbon types, you can now draw on Ryerson stocks for 2221 different kinds, shapes and sizes of stainless steel. And Ryerson stocks of carbon and alloy steels are just as large and diversified. So for stainless that solves welding problems —and every other steel requirement, call your nearby Ryerson plant.

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The Iron Age Newsfront

Detect Layout Problems

Visual plant planners have now gone a step beyond fixed scale models to the use of working models. In one case a working model of a steel bar mill uncovered 14 major and minor construction changes that would normally have waited until the equipment was installed. Savings in time and cost were substantial.

Automation Filters Down

Automation has now reached down to all levels of the metalworking industry. Much of the work being done today centers around automatic feeds and ejectors and automatic cycling equipment. Many of the new automation devices do not attempt to tie in equipment with automatic conveyors.

Europeans Switch To H-Beams

Alert American visitors to French and German industrial plants have noticed a significant and rather ominous difference in plant construction. Wide-flanged H-beams are being substituted for conventional I-beams. The H-beam is designed to withstand heavier lateral loading, which might occur during an explosion.

Instruments Cut Power Costs

To lower costs several U. S. steel plants which combine purchased and in-plant generated power are guiding their own output by load recording instruments. Aim is to use the purchased power, bought in blocks, to a maximum amount without hitting the next cost category. When limits are neared, in-plant generators are stepped up.

Wage Hikes Will Bolster '56 Markets

Full effect of the Federal and industrial wage and salary increases are still to come. Impact on fourth quarter sales will be substantial. During the summer a lot of this money went for vacations. Now come homes, appliances and general spending including more cars. Industry will see this phase as support in 1956.

Sales Up For Resistance Welders

New orders for resistance welding machines and equipment for the first seven months of this year are 37 pct ahead of the same period in 1954. Shipments are also ahead by 23 pct.

See Growth In Plastic Molding

Metalworkers can expect growing competition from plastic molded parts. As an indication, one prominent machine tool builder has designed a new heavy hydraulic injection molding machine featuring new circuits, sees an expanding market in almost everything from automobiles to household furniture.

Bigger Shot May Cut Fatigue Strength

At a given intensity, increasing steel shot size will not necessarily improve fatigue strength, according to recent tests. Early findings point more and more to the importance of surface finish before and after shot peening. There is the possibility that larger shot may alter surface finish enough to adversely affect fatigue. Validity of this is now being checked for a number of steels at different hardness levels.

Tax-Am Review Irks Railroads

Some railroads are irked over government's suspension of further fast tax amortization aid for new freight cars during the current review of the tax-am program. Rumors around Washington are that the entire car building program may be called off and ordering stopped until fast write-off privileges are restored.

Shortage Strains Customer Relations

Steel companies are privately alarmed over customer relations because of the steel shortage. When the market lets up—no one knows when that will be—the first thing on the calendar is to cement the breaks, dents and holes in customer feelings. This is more serious than appears on the surface.

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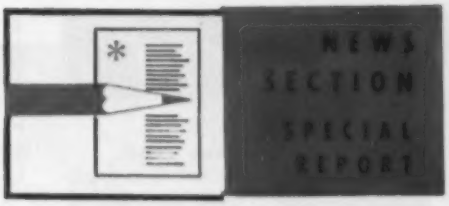


Machine Tool Show Stirs Market

Buying interest exceeds best expectations . . . Top brass and best technical men probe show for ideas . . . Automatic features attract most interest including smaller manufacturers—By *E. J. Egan, Jr.*

◆ NO SINGLE EVENT in the past eight years is likely to have more impact on metalworking practice than the Machine Tool Builders Show now in its second (and final) week at Chicago's International Amphitheatre.

Almost without exception, every builder who had something new to show reported buyer interest above his expectations, saw promise of an active market ahead. Few machines were sold off the floor—It takes a buying team to specify major tooling—but most exhibitors rated inquiry quality "excellent."

"We're not only seeing top brass here," one exhibitor told THE IRON AGE, "We also have good indications that top management is sending its best technical men to Chicago to bring back detailed reports on new ideas and tools.

Like Automatics

Automation and automated equipment naturally got a big play. Machines equipped with automatic loaders and unloaders had viewers two and three deep around them for hours. Exhibitors at the Builders Show or the companion Production Engineering Show who furnished feeding or checking devices also got a big play.

But Show visitors did not restrict their interest to the big mass production transfer type machines. What stirred much of the crowd interest were automatic loaders, automatic cycling and automatic gaging equipment. It was clear that interest in automatic processing has now passed beyond the big mass producers to the smaller shops.

It was clear too that metalworking executives were carefully considering the possibilities of new equipment having at least some automatic features.

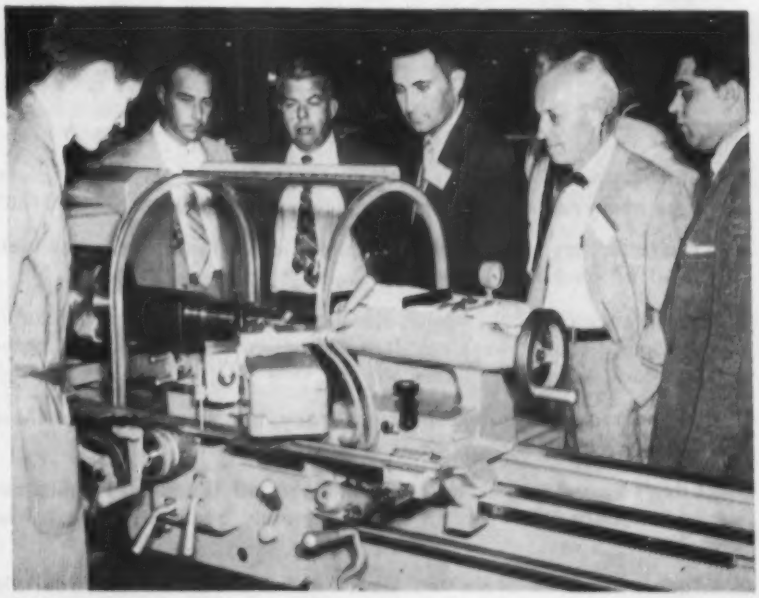
Good Leads

Said one exhibitor, "We're meeting here men like master mechanics and manufacturing executives who carry a lot of responsibility for making decisions on materials and equipment. We've picked up more good leads here in the last few days than we usually get during the whole week of some other shows. But this automatic stuff costs money and these fellows have to study all the angles."

Billed as the automation show, the concurrent Production Engineering Show at Navy Pier drew somewhat less than expected attendance though quality of visitors and inquiries were reported high. The Machine Tool Show itself featured a good deal of automation on machines—the former concentrated on accessories.

More Controls Shown

Trend toward automatic accessories is growing along with demand for special controls and circuitry for the new machines. Featured were air, hydraulic, electronic and electro-mechanical controls and devices. Also evident is the trend to simplified unit assembly of control components so that failures can be quickly spotted, sub-units replaced.



EXPERIMENTAL cemented oxide base tools cut up to 2500 fpm, give smooth finishes.

SPECIAL REPORT

▪ Machine tool trends . . .

Quick tooling and setup changes —Name your basic machining process and you'll find builders concentrating on ways to help the shop that must change setups 2 or 3 times a day. One builder of multiple spindle automatics draws record crowds by promising an 18½-minute tooling changeover and schedules the demonstration for a specific time during show hours.

▪ Pre-selection of speeds . . .

Another trend is toward reducing physical or mental effort required from the machine operator or attendant. In multiple-step operations, the engineering department decides optimum speed and feed conditions, which can be fed into a tool's "memory" box. The operator merely pushes a button to initiate successive cycle steps and the tool works automatically at the predetermined rate.

▪ Cemented oxide tools . . .

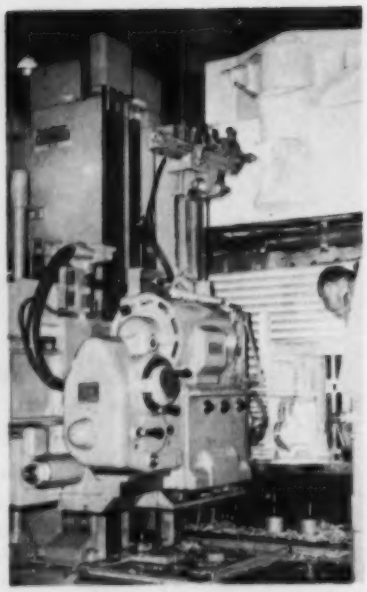
Possible super-speed supplements to cemented carbide tools. These new materials are still in the experimental stage. Several lathe builders at the show are giving them a tryout at speeds up to 2500 sfpm, note that they produce an excellent surface finish. Big question: Can the new tools take big bites?

▪ Tracer controls . . .

They're spreading out—and fast. You'll see more lathes, milling machines and shapers built to include these contour-following devices. Latest addition to electric, hydraulic and air-actuated tracer units is one that maintains a constant spark gap between the tracer stylus and the master pattern. It's said to be very accurate and subject to minimum time lag in guiding the actual cutting tool.

▪ Automatic handling . . .

There'll be more and more of this equipment available for all types of machining operations. Handling devices not only reduce operator fatigue; they save time by being closely synchronized with actual cutting, grinding and forming processes. Designers are beginning to think of ways to make loading and unloading devices flexible enough to accommodate a wide range of workpiece sizes and shapes.



TRACER controlled milling machines reproduce master shapes fast and accurately.

▪ Gaging and inspection . . .

Goal here is to build self-resetting characteristics into more machine tool types. Steady progress is being made with built-in sensory devices that gage the workpiece, interpret its dimensions in terms of tool wear, feed this information back to components that adjust the tooling.

▪ Infinitely variable speeds . . .

Tool builders and manufacturers of regulating devices are finding ways to achieve so-called "stepless" control throughout speed and feed ranges. Offshoot of this principle is one that automatically speeds up or slows lathe spindle rpm to maintain a constant surface speed for the workpiece.

▪ More carbide tooling . . .

Not a new trend exactly but one that's growing by leaps and bounds as tool builders "beef up" their equipment with more powerful motor drives and more rigid construction. But that's not the whole story. Carbide tool producers are merchandising the potential savings possible through the use of indexable and other throwaway types of tool bits.

What Builders Are Saying:

▪ "This business is moving fast . . . As soon as this show closes we'll go home and start designing machines for the next one in 1960."

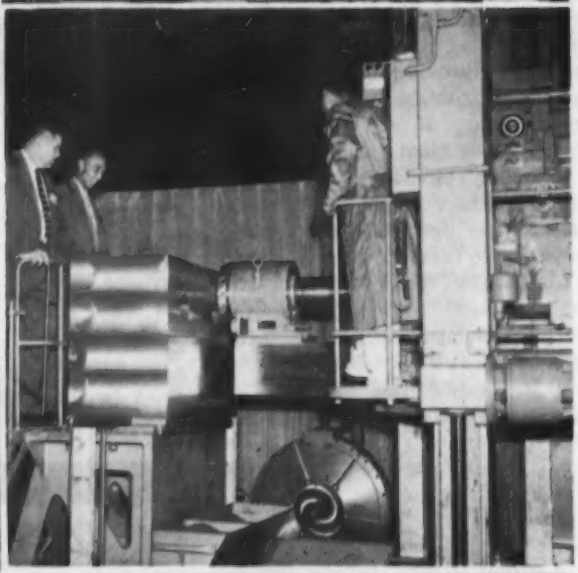
▪ "We're frankly surprised at the heavy attendance and what looks like real interest in buying new tools."

▪ "It's time we thought about standardizing on methods of feeding data into automatic machines. If we're going to use tape, let's agree on type and spacing of holes."

▪ "We hear a lot about greater accuracy, but whether or not these people are willing to pay for it is another matter."

▪ "I don't care whether we sell a machine off the floor. I figure our job is to create interest, and we've certainly been getting a lot of that."

▪ "Tape controlled 'brain' machine may be in the Cadillac Eldorado class, but a lot of other automatic equipment seems to have moved into the Buick class where more people can buy it."



Top—Left: **SPEED and versatility of new heavy shaper aroused interest. Note heavy chips.**

Top—Right: **AUTOMATIC tracer lathe features quick cycle changes, automatic loading and unloading.**

Center—Left: **FASTER, more accurate general purpose tools appeal to owners of small and medium shops.**

Center—Right: **HOGGING out chips, this 16-in. face mill brought a stream of visitors to tool display.**

Right: **TREND in automatics is to faster tooling changeovers for medium run production.**

PRODUCTION

STEEL: 150 Million Tons by 1960?

BDSA predicts demand will approach 150 million tons . . . Says today's "deficit" is 9 million . . . Defense requirement predicted to stay at 18 million tons a year . . . Write-offs will be needed.

◆ INDUSTRIAL MOBILIZATION planners are told to get ready for a 24-million ton increase in steel ingot demand by 1960 and to have enough raw materials and pig iron to support the growth.

In five years, a new Business and Defense Services Administration report predicts, the need for ingot production will be up to 150 million net tons. BDSA points out that fast tax write-off benefits should be provided both to insure added ingot capacity and to boost construction of such supporting facilities as blast furnaces.

If the steel industry raises its ingot production potential by 24 million net tons, says the report, capacity to turn out an additional 17 million net tons of pig iron will be required.

Government expansion goals for steel ingot and blast furnace capacity lag behind present levels. The goal, closed late in 1953, was for 120 million tons. Blast furnace goal, closed at the same time, was for 87 million tons.

Defense Static

Current civilian demand for ingot steel is figured at the rate of 117 million tons annually and the minimum defense requirement at 18 million tons, making a total "required capacity" of 135 million tons. Actual capacity today is 126 million tons. This means a "deficit" this year of 9 million tons in capacity, BDSA calculates.

The agency sees the minimum defense margin remaining at 18 million tons a year through 1960, while civilian demand and total required capacity are figured as:

In 1956, civilian 120 million tons, total 138 million; in 1957, civilian 123, total 141; in 1958, civilian 126, total 144; in 1959, civilian 129, total 147; in 1960, civilian 132, total 150.

Even if Office of Defense Mobilization whipped up an immediate program to raise total capacity to 150 million tons, the job would take two to five years because of construction and other needs, BDSA figures.

Not Far Apart

The report recommends the open expansion goal of 222,000 tons of capacity for large steel castings be retained for the present to relieve a deficiency. It calls for a reopening of a gray iron casting goal of 55,000 net tons.

Thinking in the steel industry on increased steel capacity is close to that outlined in the BDSA report—except for the so-called deficiency of 9 million tons.

If that figure were to be eliminated from the situation the needs are about the same as were outlined in THE IRON AGE, June 22, 1955, p. 53. Generally it is expected that steel people will expand their capacity to the extent of about 3 million tons a year for the next 15 years.

It may be that the increase will not come in a straight line progression but it is almost certain that 15 years from now the average yearly increment will be 3 million tons or more.

Humphrey Opposed

But the expansion in steel ingot capacity is bound to await a clear concept of rapid amortization. If the government insists on its version of a defense cushion (18 million tons) in addition to probable civilian demand, then industry sources may insist that fast write-offs be granted. IRON AGE editorial: (Is There Enough Steel Capacity? Sept. 8, p. 7) The fast write-off question is a hot one now. George M. Humphrey, Secretary of the Treasury has cast a skeptical eye on many more fast write-offs on the basis that industry can afford to do its own expansion. But the Office of Defense Mobilization is understood to have a slightly different view of the situation. ODM has yet to make known its recommendation or its expansion plans.

Data from ODM?

It is felt in industrial circles that the BDSA report has some of its inception from the ODM report not yet written or made public. ODM officials privately have believed that a 3 million ton a year expansion was necessary and should get under way quickly.

The gigantic expansion program announced by Charles M. White Republic Steel president is probably the kickoff in what will be a parade of big and substantial programs—regardless of ODM's action or the Treasury's. (See p. 102.)

COPPER: Report on a Tinder Box

Sagging U. S. mine production and rapidly rising domestic demand force consumers to rely on Chile . . . Unstable economy and national politics combine to cause supply crisis—By *F. J. Starin.*

• COPPER supply in the U. S. is at the critical stage. It eventually will show gradual improvement, but recovery will take a long time. Meanwhile, the sick copper situation is infecting its dependent consumers.

Not since 1940 has enough copper been mined domestically to meet the demand. Nor is it likely that it ever will be again. But while consumption has steadily increased, producers are prevented from producing at capacity by a weird combination of factors involving foreign politics, world markets and world Communism.

The only sources from which copper is generally available to the U. S. consumer are from inadequate mines at home and from Chile. And it is in this South American country where the bottleneck occurs, and where any permanent remedy must occur.

Basically, Chile has ample sources of copper but not enough engineering and technical know-how to get the ore out of the ground and exported. It depends on American subsidies of Anaconda Copper Mining Co. and Kennecott Copper Corp. to do the mining. Since copper is by far the principal Chilean export, it serves as a valve on the national economy. As a result, the Chilean government maintains a tight control of copper operations.

New Law

Until May of this year, the method of control consisted of forcing the subsidiary Chile Copper Co. and Braden Co. to sell their copper to the Chilean government at a price considerably under the market value, between 20¢ and 25¢ per lb, for resale as the government saw fit.

In addition, the mining companies were compelled to purchase their necessary Chilean currency from the *Banco Central de Chile*, the national bank, at a rate of exchange that ran as low as 10 pct of the market value. The tax on net profits was a fixed 60 pct.

Pressure from the mining companies brought about Chile Law 11828 in May, 1955, which at least on paper seems to give the producers a better break.

The fixed net profits tax drops to 50 pct with an additional variable surtax of 25 pct depending upon the production rate.

Provision is made for rapid amortization on new equipment.

The companies still must purchase their *pesos* from the Chilean national bank, but at a slightly better exchange rate.

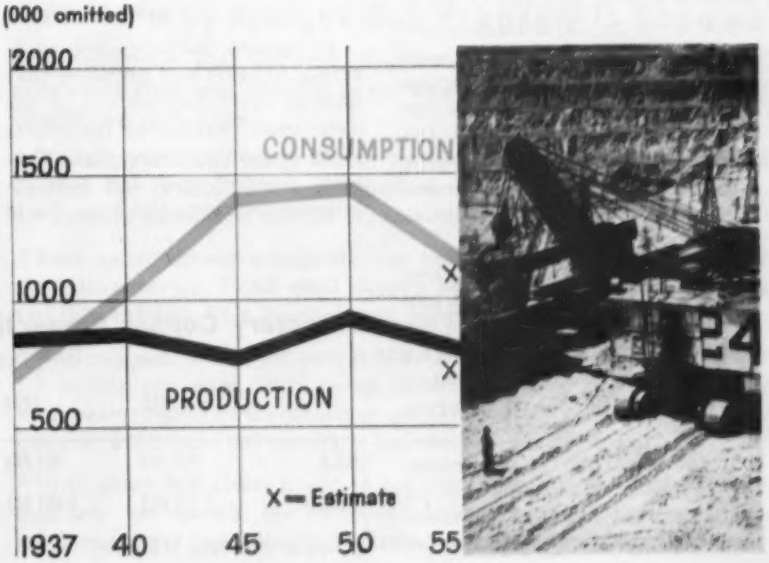
But at first glance the big concession would appear to be permission granted to the mining outfits to sell their own copper where they see fit.

However the law also sets up a watchdog organization called the copper department which is empowered to "exercise inspection over and establish conditions for production and commerce of Chilean copper." Thus, in effect, the government retains the ace of trump by being able to review and alter, with no possibility of appeal, commercial methods and markets.

Mining Companies Outvoted

The newly formed copper department is administered by a committee consisting of the minister of mining, three representatives of the President of Chile, two directors of the *Banco Central de Chile*, one representative of the Chilean workmen and another of general employees, and

U.S. Copper Mines Falter



two representatives of the copper producing companies subject to the law. Obviously the mining firms are substantially out-voted on any decision ten to two.

Other powers granted to the copper department under the new law are the right to verify all contracts, prices, freights, insurance and methods of sale; the right to represent the companies in contracting directly for the sale of copper; and the right to control production in proportion with operations maintained by Anaconda and Kennecott outside Chile, should the companies desire to reduce operations.

Forward Selling

Even with the new law Chile holds the reins and the producers must pull the copper cart where and when they are directed.

Most of the copper arriving in the U. S. today is forward copper contracted for by the government under the old law. Chile is permitting the mining companies to fulfill these agreements as a matter of honor. However when these run out—and there is no indication of forward selling now—the outlook is rather bleak.

Price Pressure

With the wide price differential between Europe and the U. S., it would seem to Chile's advantage to ship as much copper as possible to Europe for greater remuneration. The outstanding hope for the American consumer is the high regard in Chile for the Yankee dollar. Its stability and reputation make it preferable to English pounds sterling.

Now Chile is trying to close the gap between the London and New York prices by putting on the pressure, through both diplomatic discussion and the best method of all—keeping the U. S. supply short.

If she is successful this means that possibly before the end of the year or early in 1956 the American consumer will see another boost in the price of copper with promises of an increase in the supply. U. S. companies are resisting because a higher price invites competition from other metals. And besides, they are making money at the current rate. However, it is doubtful that they can hold out.

Tettering Economy

The biggest fly in the ointment, the one which very well may cause the whole situation to blow skyhigh, is the Chile economy. The country is in the throes of a dangerous spiralling inflation. A good indication of this is the salary level the mining companies must pay the Chilean worker. Rates are tied to a cost of living index subject to annual review. This year the workers got a 25 pct increase in pay.

Just a short time ago the open market rate of exchange for Chilean *pesos* was from 200 to 250 per dollar. At this time one can get 850 *pesos* for one United States dollar. And the end is not in sight.

If the inflation begins to level off and things come down gradually a relatively happy ending is entirely possible. More likely is the possibility that wages and cost of living will chase each other to dizzy heights and then both crash down with force enough to threaten the entire economic system. What will happen to the copper mining companies in that case is anybody's guess.

Strike Threat

At present, the producers, while trying to exert any influence they have to avert disaster are, at the same time, considering the effects of an impending depression. They have research men and field engineers searching the Free World for another source of copper. They must. Anaconda, for instance, in 1954, produced 5/6 of its copper outside the U. S., the bulk of this from Chile.

A more sinister complication is the possibility that serious copper strikes, not only in Chile but in North America as well, are part of the Communist scheme to undermine U. S. economy.

Economist Eliot Janeway ties in serious copper strikes in the U. S. with the technique of a series of crippling strikes that has nearly disrupted the Chilean economy. He points to what he calls the "installment plan" technique of the general strike before demand has been revived.

Consumers Switch

He says that the combination of Communist control and local pressures produced strikes in Chile at well spaced intervals. Added up over a period of years, tremendous tonnages of metal have been lost. It all adds up to tremendous inflationary pressure not only in the U. S., as is going on now, but world wide.

Consumers are reacting to this unstable market condition by seeking copper substitutes among other metals. There are definite signs of a big move from copper to aluminum in the electrical field. Order books do not reflect this yet because the move is in the experimental stage with engineers working on adaptation procedure. It is expected that many interested companies will iron the bugs out this year and the beginning of the next quarter will definitely establish the trend.

Aluminum's big advantage is a stable - even - when - tight market offering assured production rates.

Primary Copper Production for Domestic Consumers

(Short Tons)

	1951	1952	1953	1954	1955*
U.S.A.	964,589	961,886	957,318	863,721	585,350
FOREIGN	1,378,833	1,401,001	1,441,874	1,494,386	906,835

(Copper Institute statistics) *first seven months

FREIGHT CARS: Watch For Shortage

New car building program is lagging . . . Ill-timing and tight steel market are factors . . . Flood emergency steel requirements add to builders' procurement problems . . . Rails may seek Government help.

◆ ARE WE HEADING into another freight car crisis? Some observers say it's more than just a possibility. The freight car building program, ill-timed in the first place, is lagging badly. Coupled with continuing high level industrial activity, the situation is gloomy.

Some industries already are feeling the effect of car shortages. A large coal company is shipping 20 pct less than its business volume demands for lack of cars. Steel companies and others have run into spot shortages. With the harvest season getting underway, a further strain will be imposed on available supply.

The Pennsylvania Railroad and other roads are pushing a campaign to keep existing cars moving to minimize idle layover time and to increase efficiency. The Pennsy figures that if it can keep every freight car on its line moving an average of 15 more minutes a day it would be equivalent of 20,500 more cars a day for shippers.

Flood Adds To Woes

Behind the looming crisis is a combination of (1) the late start of railroad order placements, (2) the tight steel market, and (3) the Northeastern floods.

The railroads' 50,000-car program came at a time when steel structurals and plate, which comprise the bulk of tonnage going into cars, were in extremely short supply. At best, the railroads were bound to have trouble obtaining their requirements.

Then the flood hit. Steel necessary to rebuild bridges and other structure in the stricken area has been given priority. Structurals, particularly, are urgently needed for the rehabilitation program. Some plate also will be needed. Sheets and bars, which also go into freight cars, are other items that will be tagged "emergency" when necessary for flood work.

Car Deliveries Drop

It's doubtful that freight car builders can get production above 4000 units a month by end of 1955. Total production will be in the neighborhood of 40,000 cars, which is likely to be far less than the number of cars scrapped. In that case, the year will wind up with a deficit. Car repair programs also are handicapped by lack of steel.

New car deliveries in July dropped to 2192 from 3015 in June. If they can rebuild their steel pipelines to a goal of 45 days' supply, car builders hope to be producing at a 6000-unit-per-month clip early next year. And at the moment, that's a big IF.

If the car supply situation worsens as expected, it's likely that the railroads will pressure the Government for priorities to keep their program moving. This probably would create a rhubarb with other steel consumers who see their own needs urgent, too.

Hassle Over Fast Tax

Meanwhile, the Office of Defense Mobilization has tentatively halted issuing Certificates of Necessity covering freight car building pending a study of earlier programs, which theoretically were part of the defense buildup. The Certificates give the railroads tax concessions on a certain part of the cost.

As a result of this hassle, some railroads are holding up placing of car orders until ODM clarifies its position on cars and other construction programs with a possible defense angle.

Why Freight Car Program Is Bogging

▪ The program was ill-timed. Railroads placed heavy orders for cars when steel was already in extremely short supply, particularly structurals and plate.

▪ The situation was made worse by the Northeastern floods. Steel needed for rehabilitation of flood areas is being given priority. Structurals and plate will be especially hard hit.

▪ Even under normal conditions, car builders require time to rebuild their inventories. Tight steel supply has extended time necessary for this buildup. This has delayed speeding up of production lines.

▪ Nation's pool of freight cars is 100,000 units short of Government's 1.8 million car goal. With scrap losses offsetting new car production, achievement of Government goal is five years off even if steady pace of 6000 cars per month is maintained over this period.

▪ With other industries likely to set a fast pace through the winter and into the spring, the railroads face a continuing struggle for steel and other components to keep their program rolling.

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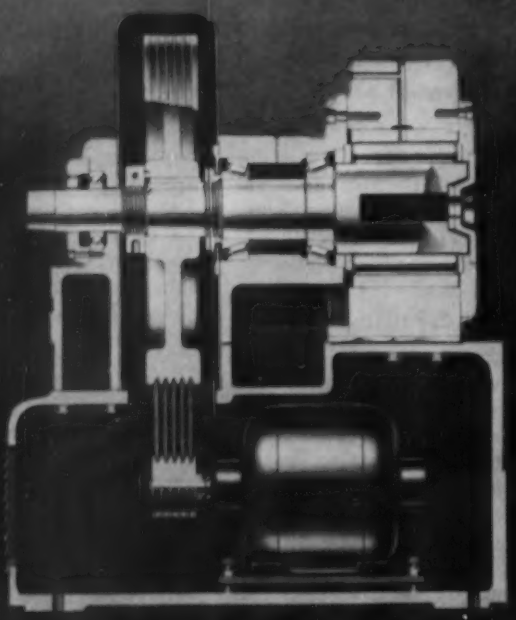
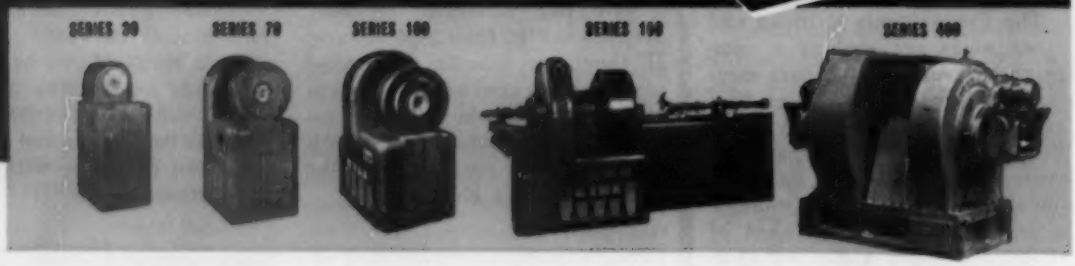


A COMPLETE RANGE OF SIZES AND CAPACITIES



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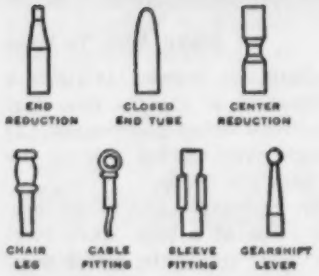

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AUTOS: Congress Probes Bootlegging

Senate subcommittee considers legislative action on unfranchised automobile sales . . . Phantom freight charges, authorized territory security also on the agenda . . . NADA backs bills.

◆ A SENATE SUBCOMMITTEE is out to find just what new car dealers think about marketing factors which influence the sale of this year's massive automobile crop by going directly to the source.

Timed to coincide with the period when manufacturers are switching over to production of 1956 models is a dealer survey by the Monroney subcommittee of the Senate Commerce committee. Answers to questionnaires mailed to some 40,000 car retailers will help to determine whether the congressional group will open a full-scale investigation of auto distribution practices before winter.

Assn. Campaigns

Primary purpose in circulating the 20-question forms is to get the car seller's viewpoint on the need for legislation to counteract auto bootlegging and phantom freight activities, and to authorize territory security.

Bills to bring about these actions were introduced in the House during the recent session of Congress and were accorded one day of hearings before a House Commerce subcommittee. There was no definitive handling of the bills before the session closed, therefore measures remain on the committee calendar for action in 1956.

Strong support has been provided this legislation by the National Automobile Dealers Assn., representing a substantial percentage of all new car retailers. The organization has been campaigning especially hard for a law that will eliminate bootlegging, the practice whereby some franchised dealers unload excess stocks of new-model cars to unauthorized retailers at a discount.

This activity has been widely condemned as dangerous to the established dealers, for the unauthorized marketers resell the new cars at prices too low for conventional dealers to match. NADA opposes bootlegging, and now the Monroney subcommittee hopes to learn whether individual sellers want a law to ban it.

Seek Dealer Opinion

The cure proposed in current legislation is to make it mandatory for manufacturers to refuse to deliver their cars for resale to any dealer involved in a bootlegging operation. Because a law along these lines would call for cancellation of the franchise of a dealer who gets out of line, dealers are asked to give their opinions on the necessity, or lack of necessity, for the law.

Forms mailed to them, which may be returned unsigned, inquire whether the dealer believes overproduction, manufacturers' pressure to dispose of cars, an excess of sellers, or other factors may be the principal causes.

Phantom Freight

These forms also ask if dealers want a return to the territorial security clauses included in their franchises until about five years ago. Such clauses, abandoned when an informal U. S. Justice Dept. opinion indicated they might be illegal, would call for payment of a fee by a car marketer to another retailer in whose territory he had sold an auto.

A third major question is whether dealers are paying excessive ("phantom") freight charges on cars delivered to them for retail selling. Complaints reaching the subcommittee indicate that dealers may be paying home office-to-dealer freight costs.

Subcommittee Quiz

QUESTIONNAIRE

IMPORTANT: Please indicate answers by marking (x) in appropriate spaces. If you wish to make additional comments, use separate sheet.

1. Do you feel that there is need for Congressional study or federal legislation with regard to automobile dealers' problems in the field of automobile marketing? ( ) Yes ( ) No

2. For what line(s) is your present franchise?

Buick	( )	Hudson	( )
Cadillac	( )	Lincoln-Mercury	( )
Chevrolet	( )	Nash	( )
Chrysler-Plymouth	( )	Oldsmobile	( )
De Soto-Plymouth	( )	Packard	( )
Dodge-Plymouth	( )	Pontiac	( )
Ford	( )	Studebaker	( )
Kaiser-Willys	( )	Foreign	( )

3. During the past 20 years with how many automobile manufacturing companies have you held franchises?

4. How long have you been a franchised new car dealer?

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Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Spending:

Defense Dept. denies cuts will slow arms buying.

New economy moves in the Defense Dept. will not result in any reduction in procurement of ships, planes, tanks, or components. Efforts to pare spending will continue to be directed at whittling away fat in the overhead, eliminating duplication and waste.

A top Pentagon fiscal official tells THE IRON AGE that recent reports of drastic cuts have "no basis in fact."

Total ordering (THE IRON AGE, Sept. 8, p. 33) actually may rise over last year's $16 billion. The Navy intends to increase orders for ships and aircraft; the Air Force will increase its orders for planes and missiles; and the Army, as originally planned, will reduce its buying. But the Army reduction will probably not be big enough to offset increases in the other services.

Defense officials believe the rumor of drastic cuts got started this way: Present military spending is at a rate over $35 billion a year, but officials said in the mid-year budget review that planned economies would bring the figures to $34 billion by the end of this fiscal year.

Treasury Sec. Humphrey has asked all government departments to try to reduce expenditures 3 pct, which would bring a balanced budget for this fiscal year. A further 3 pct cut in defense spending would mean a $33 billion outlay.

More Get Tax Aid

Office of Defense Mobilization will permit 34 new or expanded facilities costing $20.6 million to be built under the fast tax amortization program. Okays cover applications filed prior to the current review of the system.

In the latest group of fast tax certificates, the three largest go to the Holley Carburetor Co., Warren Township, Mich., which is permitted to write off 45 pct of $2.1 million for military jet engine controls; the Firestone Tire & Rubber Co., Los Angeles, 40 pct of $2.6 million for ordnance parts, and New York State Electric and Gas Corp., 45 pct of $2.5 million for electric power transmission facilities.

Other certificates go to U. S. Steel Corp., Oliver Mining Div., 75 pct of $1.5 million for taconite pelletizing facilities; Associated Spring Corp., Bristol, Conn., 50 pct of $842,000 for cold rolled spring steel for military items; and American Machine and Foundry Co., Buffalo, 65 pct of $38,000 for ordnance.

May Probe Low Bids

Bids on government contracts that are so low as to appear "ridiculous" must be challenged by procurement officials, the General Accounting Office rules.

In a new ruling on contract bidding procedures, the GAO says that other bidders have their rights, too, and that the government has an obligation to demand a full explanation of ridiculously low bids on advertised contracts.

Fact that the government stands to save money by accepting the low bid is not a determining reason, the GAO says. The rights of other bidders must be considered.

Name ODM Official

Frank C. Ogden, manager of purchases and real estate for the Detroit Edison Co., has joined the Office of Defense Mobilization on Oct. 1 as assistant director of materials.

In his new post, where he succeeds William S. Floyd, Mr. Ogden will be responsible for advising the ODM director on the quantity of materials needed to meet defense and stockpile goals and on materials expansion and procurement programs. The retiring assistant director, Mr. Floyd, is returning to the Shell Oil Co.

Mr. Ogden, a resident of Grosse Pointe Shores, Mich., is a past president of the National Assn. of Purchasing Agents and a member of the Engineering Society of Detroit.

Plane Detector

SOMETHING NEW in hatwear is this helmet for Ground Observer Corps use. Hat mounted pick-up device, called a passive detector, has fingertip volume control, permits observer to work visual aids while listening.

EXPANSION IN INDUSTRY

REPUBLIC: To Expand 16 Pct

Set to spend $130 million on enlarging present facilities . . . New capacity expected to be about 11.88 million tons.

• REPUBLIC Steel Corp., nation's third largest steel producer, has announced plans for an expansion which will cost an estimated $130 million.

Republic intends to get the most for its money by spending the bulk of it over a three year period on increasing the size of present facilities at Cleveland, Warren and Youngstown, O., Chicago, and Gadsden, Ala.

The investment is expected to boost Republic's capacity by about 16 pct, an increase of 1.618 million tons of steel ingot annually.

This would make their yearly production capacity about 11.88 million tons.

This would make the yearly to profit most by the expansion with a potential increase of 732 thousand tons of steel. Planned addition to the Cleveland wide sheet production is aimed directly at the automotive industry which has been locating more of its stamping facilities in this area.

The great majority of the expanded facilities will be in the Lakes region. The Ohio plants at Youngstown and Warren will add over 400 thousand tons to their annual capacity; Chicago about 312 thousand. This is because the company considers these plants to be in the ideal location to serve the nation's greatest steel consuming area.

The planned increase of 168 thousand tons in Gadsden, Ala., is significant because it anticipates a growing need for steel in the southeast. In addition to the increased production Republic intends to install flat rolled and galvanized facilities here.

This is by far the largest expansion undertaken by Republic, surpassing even the major mergers and plant acquisitions previously manipulated.

The greater part of the cost will be paid for out of depreciation, amortization and retained earnings. In order to provide a reserve, if necessary, Republic made arrangements with a group of large commercial banking institutions for a five-year revolving credit of $75 million at the prime interest rate in effect at the time with an option to convert the credit into a five-year term loan at the end of the credit period.

Although the program makes no provision for new blast furnaces, additional iron will be derived through use of taconite pellets and high quality Labrador ore.

New Mill Facilities

The uranium processing mill of Union Carbide and Carbon Corp. located at Uravan, Colo., is the object of a construction program, already in progress, designed to boost its production capacity.

During the expansion the plant will continue to operate at its usual rate with the output gradually increased as the new facilities are integrated. Completion of the project is expected by early fall 1956.

Program is under the supervision of Kenneth Rush, president of the corp.'s newly formed atomic energy div., Union Carbide Nuclear Co., who made the announcement following the signing of a contract with the Atomic Energy Commission.

Install No. 4 Battery

A new battery of 75 coke ovens will be constructed at Indiana Harbor Works of The Youngstown Sheet & Tube Co. Work on site clearance is underway and the battery is expected to be in operation by September 1956.

This is the third large construction project for Indiana Harbor announced by the company since last May. Earlier projects include construction of a seamless tube mill and additional tin plating facilities.

The new battery will be the plant's fourth and will be located adjacent to the number three battery which went into operation in November 1952.

It will feature underjet-fired combination ovens with additional by-products and benzol equipment and include improvements to the existing coal and coke handling equipment.

Build At New Site

The Dobeckmun Co., Cleveland, has purchased 17 acres of land on Cleveland's west side for construction of a new plant with 100,000 sq ft of floor space. The new site will house manufacturing and office facilities of the firm's Industrial Div.

Cost of the installation and related equipment is estimated at $1.7 million.

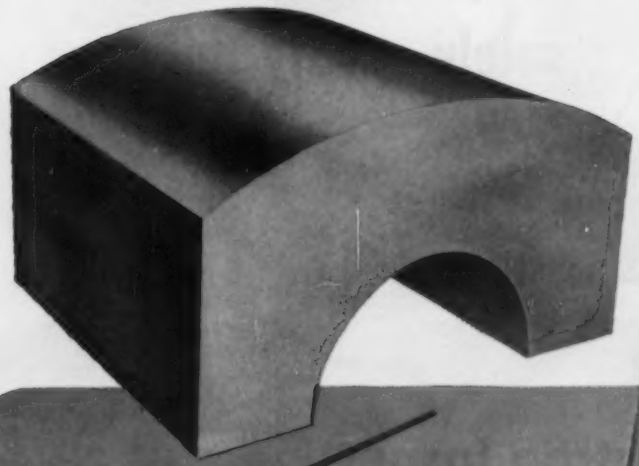
Among products to be turned out will be thermal and electrical insulating materials, metallic yarns, and moisture-vapor barrier materials for military and industrial packaging.

Adds More Space

Construction is scheduled to begin before Sept. 1 on an additional 64,000 sq ft of floor space at Rheem Manufacturing Co.'s Chicago plant. Cost of the new structure is estimated at $500,000.

The new addition will bring the plant's total space to over 637,000 sq ft and is one of the largest additions made since 1941.

Products turned out by the facility include lithographed steel drums, fiber drums, household water heaters, and central air conditioning for home installation.



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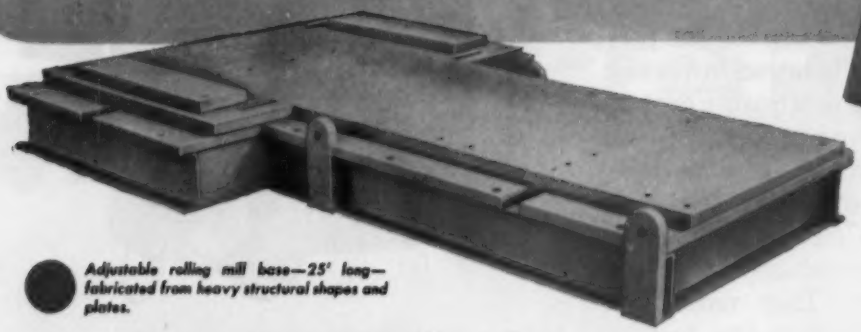

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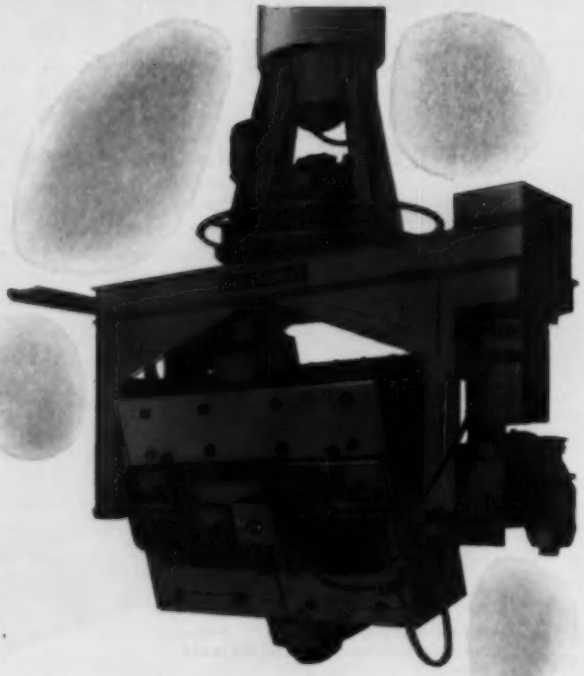

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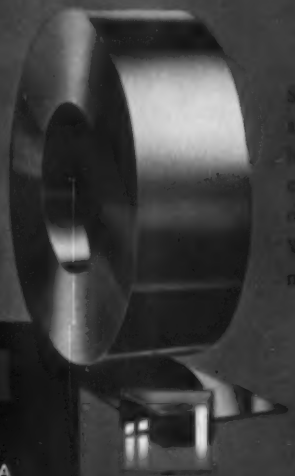

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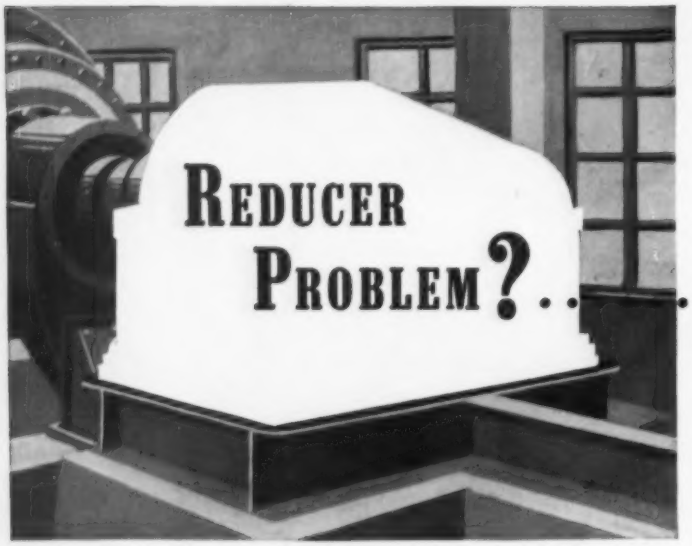
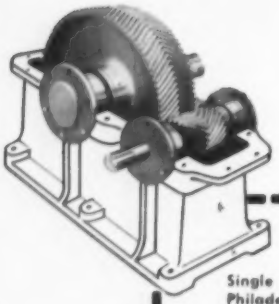


REDUCER PROBLEM?...consult



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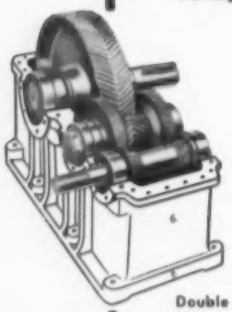
Herringbone Reducer



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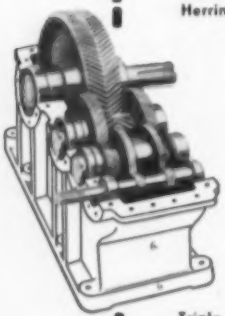
Herringbone Reducer



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Report to Management

Watch that Pricetag

Higher prices, brought about by material shortages, higher labor costs and increased prices of materials, are finally reaching the consumer. Most metalworking producers have faced them for months in their own businesses.

Only the toughest kind of competition prevented much earlier, more sizable price boosts; first when steel price had to go up, then when most manufacturers found their own labor costs climbing.

Locked in sales battles in their own fields, appliance and automakers could not pass on increased costs without risking sales losses. This was particularly true because both industries were in the cleanup stage.

But it will be another story in the next few weeks. Copper and brass prices, stimulated by shortages, international complications and the New England flood damage, are up substantially. Few producers of consumers goods will be able to withstand the compound pressure of higher costs for materials and parts as well as their own higher labor and manufacturing costs.

It's Up to the Consumer

At the end of the line of passing along increased costs is the consumer. But it's not the same consumer of ten years ago who either paid the list price or didn't buy. Today's buyer is a sharp trader and a skilled bargainer. More important, he knows his importance in the economic picture.

The result is that the consumer, with a somewhat fatter paycheck of his own and a feeling of security stimulated by the current boom, will continue to be in the market, but will be a tougher man to sell than he was earlier this year.

It boils down to inevitable higher prices, but with the consumer still in the driver's seat. This means that inflation, while still a present danger, should provide its own natural brake and there is little chance of runaway prices.

More Government Brakes?

At the same time, government officials are nervously watching to see if recent actions to slow the economic spin are taking effect. If not, more drastic actions are probable.

Consumers are going deeper into debt at a rapid clip. In one 30-day period this summer, total consumer debt rose by $425 million, reaching a total of $32.8 billion. And indications are that the rise is continuing, although at a slower rate.

But delinquencies are at the lowest level in recent years. Retail losses are under 1 pct; disposable income is running at a record $261 billion a year and average installment debt runs less than one year for full payment. Fifty-seven pct of all families don't owe any installment debt.

Government economists are still worried but it will take some time to find out whether mild brakes are accomplishing what it was hoped they would. With an election year looming, they are going to do everything possible to even out high and low spots in the economy for at least election time.

Women Stay on the Job

If your plant hires a substantial number of women, you should be interested to know that the rate of employment turnover of the distaff side is declining. Although women still change jobs more frequently than men, the tendency is becoming less evident.

Labor stability is more evident in the past five years in both sexes, but the quit rate among women has dropped faster than among men workers.

INDUSTRIAL BRIEFS

Company helicopter . . . Radio Materials Corp. of Chicago, a leading electronic component manufacturer, is now operating its own Model 47H-1 Bell helicopter for executive transportation between its plants at Chicago and Attica, Ind. Use of the helicopter in place of company planes salvages more than 800 executive working hours annually.

Division Moves . . . Removal of United States Steel's Gerrard Steel Strapping Division to new and larger warehouse facilities at 360B Shaw Road, South San Francisco was recently announced.

Industrial Diamonds . . . Responsibility for commercial development of the process for manufacturing man-made diamonds, recently announced by the General Electric Research Laboratory, has been assigned to the company's Carboloy Dept., Detroit. This department will attempt in the next few years to bridge the gap between the laboratory and the production line in an effort to make these diamonds available to industry.

Companies Merged . . . Byron Jackson Co. stockholders approved a reorganization plan calling for the merger of that company with Borg-Warner Corp. The company is now the Byron Jackson Div., of the Borg-Warner Corp.

Sales Picture . . . Kaiser Steel Corp. completed its fiscal year June 30 with net sales of $136,149,000. Shipments from the Fontana plant during the last four months of the fiscal year were the highest in the company's history. However, net earnings for 1955 were lower than those for 1954 due to higher depreciation and deferred income tax charges plus reduced steel operations during the first half of the fiscal year.

New Plant . . . Production of corrugated metal pipe at the Armco Drainage & Metal Products plant at Charny, Quebec, the company's newest, will begin about Oct. 1. The new plant will also serve as a warehouse.

Orders Diesels . . . Orders for 185 diesel locomotive units have been placed by Southern Pacific with the Electro-Motive Div., General Motors Corp., Alco Products, Inc., and Fairbanks-Morse & Co. at a cost of about $34 million. Most of the new diesels will be assigned to main line freight service.

Buys Companies . . . Acquisition by the Giddings & Lewis Machine Tool Co. of the Cincinnati Bickford Tool Co. and the Kaukauna Machine Corp. was approved and consummated. Both companies will operate at their present locations as divisions of the parent company.

To Sell Division . . . Stockholders of Penn Metal Corp. of Pennsylvania approved sale of the Steel Equipment Division to Alan Wood Steel Co. The company has retained its Highway Products Div. which fabricates corrugated metal drainage pipe and accessories.

Firms Merge . . . Mr. David Coslov, chairman of the board of the Tube City Iron & Metal Co., has announced the merger into his firm of The Coslov Co. and the Pittsburgh Ferrous Products Co. effective Sept. 1.

Purchases Division . . . The Luria Steel & Trading Corp. has purchased the Hunter Aluminum Prime Window Div. of the F. C. Russell Co. of Cleveland. The business will be continued under the newly-organized Luria Building Products, Inc. with executive offices in New York City.

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ALSO AVAILABLE IN LIQUID AND PELLET FORM . . . WRITE CUSTOMER SERVICE DEPT. FOR SAMPLE TEMPIL° PELLETS . . . STATE TEMPERATURES OF INTEREST—PLEASE!

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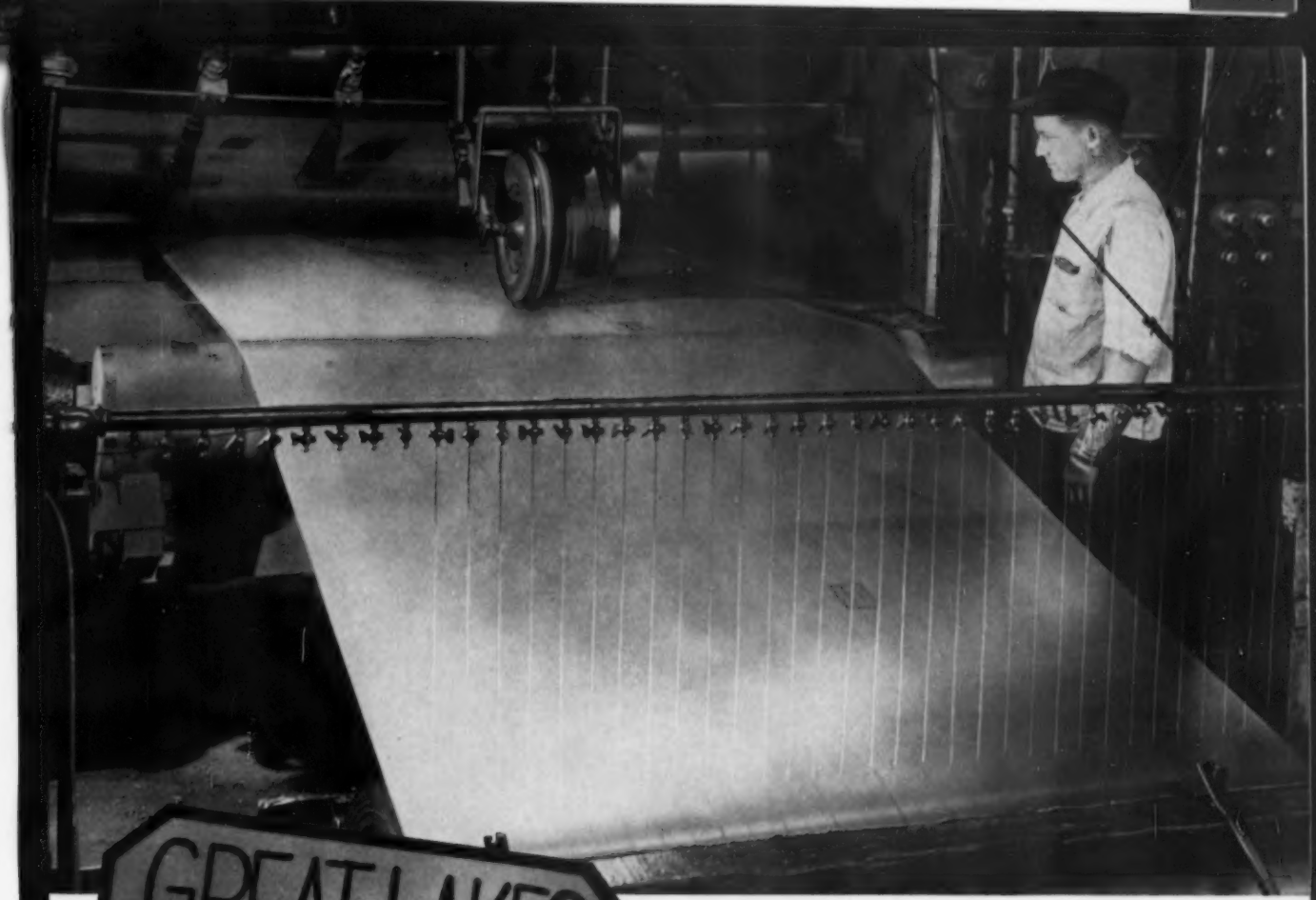
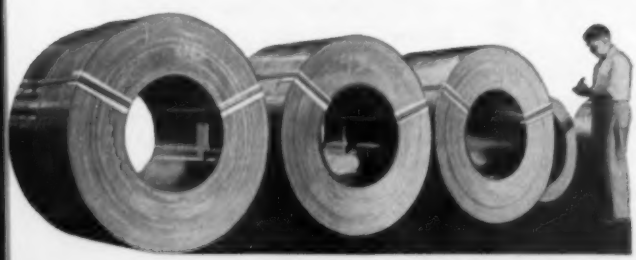


Devices such as the one shown in operation above stamp our steel with our name. Each lift and coil Great Lakes Steel produces carries such a stamp or tag bearing an identification number from which the complete history of the material concerned can be obtained.



How Great Lakes Steel *identifies* quality

Because this identification helps us give better service to our customers, it is an important aid toward an all-important goal. The goal can be summed up: *Give each customer the quality of steel to meet his requirements—when and as wanted.*

Men throughout the mill insist on *quality with service* for our customers.

We invite you to talk over your production problems with a Great Lakes representative. His assignment is to bring into your plant the steelmaking knowledge and experience of the Great Lakes organization.

GREAT LAKES STEEL CORPORATION

Ecorse, Detroit 29, Michigan • A Unit of

NATIONAL STEEL CORPORATION

How UAW Hopes to Gain More in '58

Same expiration date for all auto contract tips hand . . . UAW will repeat tactic of playing one against the other . . . Automakers hope to present solid front . . . AMC signs up—By T. L. Carry.

◆ AS expected, the new contract recently signed between Chrysler Corp. and the UAW-CIO closely parallels the agreements reached by the union with Ford and General Motors.

The only major difference between the Chrysler agreement and the Ford and GM plants was the elimination by Chrysler of wage differentials throughout the corporation. Chrysler agreed to make wages in all its plants equal to the Detroit rate with the exception of the New Orleans facility which is presently on a standby basis.

It should not go unnoticed that the similarity of the Big Three agreements even extends to the expiration dates. All three contracts will terminate June 1, 1958.

The expiration dates are now going to loom as a large item three years from now.

Good Strategy . . . Whether or not Walter Reuther, president of the UAW, scored a major victory by arranging the contract terminations remains to be seen, but chances are that he has.

The wily Mr. Reuther very deftly played Ford against General Motors and vice versa during negotiations with the two companies early this summer.

Some labor experts believe the union never would have won the supplemental unemployment benefit plan (SUB) if both the Ford and GM contracts had not expired at the same time.

Reducing it to poker terms, Mr. Reuther sat down at the Ford and GM tables with a pair in his hand and played them to the hilt. By the time 1958 rolls around, the militant UAW leader will be sitting in the game holding three of a kind — a combination which beats a pair in any kind of a game.

Easy on Independents . . . There is a possibility that the simultaneous expiration dates could work to Mr. Reuther's disadvantage. The Big Three automakers, if they so choose, are in a unique position to come to terms with the union in 1958 on an industrywide basis. The UAW is aware of this, but the chances are presently so remote that nobody in the union at least is worrying about it.

In its dealings with the Independent auto producers the union has adopted a more genteel attitude. Its settlement with American Motors Corp. delays for one year AMC's active participation in a SUB plan. This should not be taken as an indication that the union has gone soft. Rather it shows the UAW leadership is smart enough to realize that stringent economic demands can force completely out of business a company not as financially fortunate as the Big Three.

Still to be settled before the auto labor picture is complete are contracts with Studebaker-Packard Corp. Each division of the newly formed company must settle separately with the UAW and each in turn will have its own particular problems. Nevertheless, you can look for settlements that will closely parallel the delayed action SUB plan agreed on with American Motors.

"Please Winesap, no more washing up before the whistle!"

Lincoln Makes Debut

The 1956 Lincoln, the first of next year's cars to be introduced, made its public debut this month and, unlike the 1955 model, looks like it's worth a luxury car price.

The new car is available in two series this year, the Capri and the Premiere. It is the only car in the luxury class field that is completely new for 1956.

The wheelbase has been increased from 123 to 126 in. Over 7 in. have been added to its overall length and it is 60.2 in. high. The new V-8 engine develops 285 hp and has a compression ratio of 9 to 1.

Five safety devices designed to protect both the driver and his passengers are also included on the new Lincolns. They will also be included on the new Fords and Mercurys which will be introduced at a later date this fall.

RB&W FASTENERS - *Strong Point of any assembly*

Heaps of insurance for a reliable supply of bolts and nuts

YOU'RE looking at an inventory worth its weight in billions of fasteners. Stockpiled on thousands and thousands of square feet are wire and rod of various diameters . . . rectangular and hex bars in various sizes . . . materials of various kinds and analyses.

Here's raw material reserve that permits RB&W to level and maintain production at top efficiency to pass savings on to you. Here's assurance that even unusual orders can get prompt attention. Here's security for an unfailing flow of fasteners to customers and distributors.

Such a vast stockpile should also tell you how vast must be the *facilities* it feeds. To those facilities, add the skill and experience of the men operating RB&W's modern equipment . . . their long service with the company . . . and the quality control which starts with the raw material and never lets up till shipment. What *must* be the result? A truly reliable source of supply . . . more quality for your money . . . and strong fasteners that never let you down.

Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

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110th year

Plants at: Port Chester, N. Y., Coraopolis, Pa.; Rock Falls, Ill., Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Seattle. **Distributors** from coast to coast.

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Strip steel—hot or cold rolled—precisely exact to *your* specifications is an ALAN WOOD specialty. This specialty . . . and our long-established principle of "custom-producing" under the highest standards known . . . ensures you of the "right" strip for your products. In turn, this "rightness" means fewer production headaches . . . and consistent, durable quality which helps build your product's reputation and sales.

If you require strip or sheet steel . . . choose an integrated steel specialist with modern, up-to-date continuous mills . . . one who understands your production problems and delivers according to your specifications.

IRON PRODUCTS
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Plates (sheared)
Hot rolled sheets
Hot rolled strip
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ROLLED STEEL FLOOR PLATE
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SM-13

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
Sept. 10, 1955	83,445*	16,118*
Sept. 3, 1955	89,744	15,936
Sept. 11, 1954	71,423	13,320
Sept. 4, 1954	93,755	17,220

*Estimated Source: *Ward's Reports*

Seat belts which were recently made available on 1955 models will be offered as optional equipment. A dish-type steering wheel raised 3½ in. from the steering column serves as a cushion and helps absorb the force of a driver's body should he be thrown forward.

The instrument panel is coated to reduce reflection and the rear-view mirror has a special vinyl coating which reduces the possibility of shattering in a crash.

Safety:

Automakers jump on safety bandwagon.

For the past several years the auto industry has been boasting about the increased power in cars every time a new model has been introduced. As mentioned in this column before, the industry is going to do an abrupt about face in 1956 and put stress on safety features.

Ford Motor Co. cars are going to feature five safety devices. Ford announced the features at a National Safety Forum put on by the company last week at Dearborn.

Over 100 safety specialists and engineers attended from the U. S. and Canada.

Crash demonstrations using life-like dummies for passengers were a highlight of the 2-day meeting. The forum also gave Ford an opportunity to show what it has done recently in the field of safety research for automobiles.

Aid Research

In other safety program developments, both Ford and Chrysler Corp. recently gave $200,000 each to Cornell University Medical College to help expand the crash injury research program which the university has been conducting.

Both firms when they made the grants said that the results already obtained from Cornell's program have been of great value in product planning.

General Motors is also getting in on the safety act and has initiated a program to aid dealers who make driver training care available to high schools.

Under the plan, GM will give dealers a special allowance of $125 for each car that is loaned to a high school.

The allowance will help the dealer absorb part of the costs he must pay for special equipment and reconditioning of the cars when they are returned.

Purpose of the plan is to encourage expansion of high school driver training courses. GM also knows that more drivers mean more potential car buyers.

In addition to the contribution toward greater highway safety, another GM division has announced safety devices that will be available on its 1956 cars.

Both seat belts and shoulder harnesses will be offered on the new Chevrolets. This is the first car to make the shoulder harness part of its optional equipment.

Buick announced earlier this year that seat belts would be offered on its 1956 models.

Set Race Bias Talks

Representatives of industry, labor and government will meet next month with the President and the Vice President to map further steps toward eliminating racial and religious discrimination in government contracts.

Call All Parties

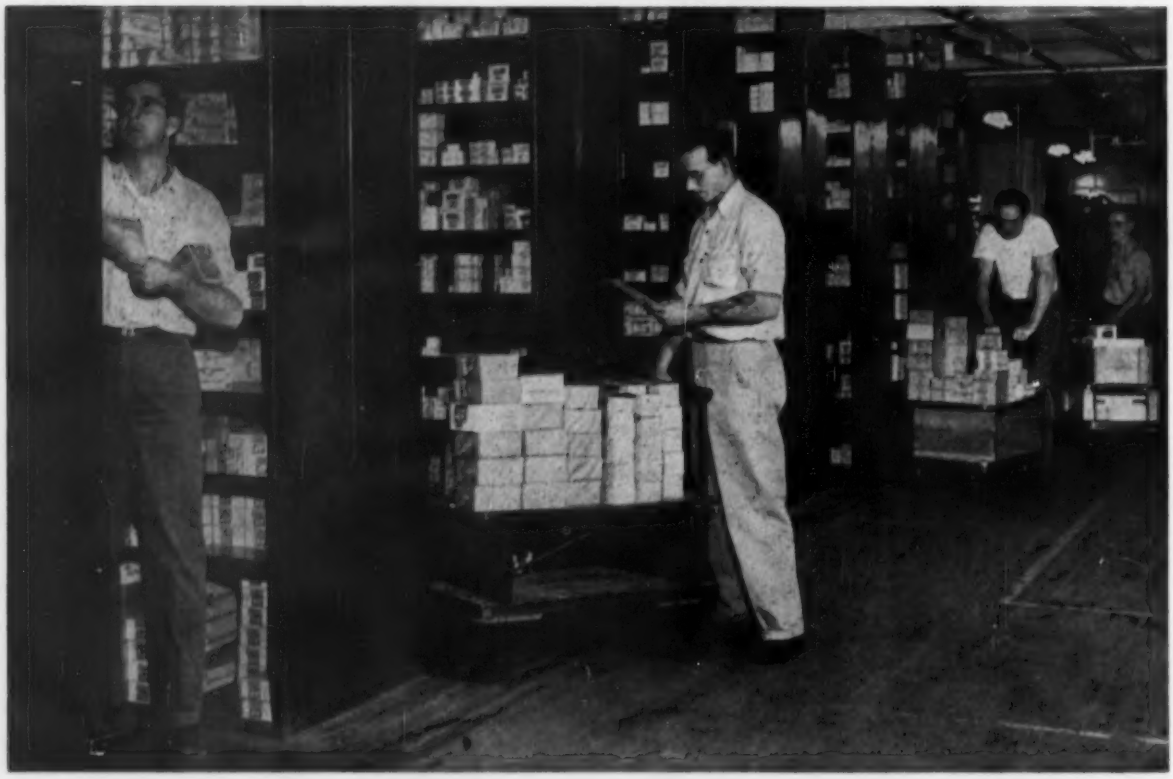
Some 65 major government contractors, CIO president Walter Reuther, AFL president George Meany, members of the President's Committee on Government Contracts and others will be involved in the conference Oct. 25 at Washington, D. C.

Labor Sec. Mitchell, in announcing the conference, says the Administration believes "great progress" has been made in eliminating racial discrimination, but that there is "room for more progress."

THE BULL OF THE WOODS — **By J. R. Williams**

JOE, WILL YOU SHOW MR. HERRIN HERE, OF TH' HALIFAX FISH CO., HOW YOU CAN LET THAT STEAM HAMMER DOWN ON A EGG WITHOUT BUSTIN' IT? I HAVE TH' EGG HERE!
POOR JOE! TH' WORST HAM ON TV ER MOVIES ER RADIO CAN AT LEAST SET A VAST AUDIENCE, EVEN IF IT'S ONLY FOR TWO WORDS!
YEH, A DOZEN EGGS AN' HE GETS ABOUT SIX SPECTATORS! FAME IS GOIN' TO BE A LONG TIME GITTIN' AROUND TO JOE!
9-14 J.R.WILLIAMS
AMERICANA

YOU CAN COUNT ON CONTINENTAL FOR EVERY FASTENER NEED!



Continental Produces Over 1,756,000 Styles and Sizes of Standard Screws Alone!

Continental offers you a greater selection than any other fastener producer

The vast inventory of fastenings offered by Continental is proof that you can always count on Continental for every fastener need. Whether your demands are for special or regular units, you will be assured of the best fastener for your job and of fast service, too.

You will profit by putting this operation to work for you. The Continental Screw Company's design engineers and production specialists offer you the benefits of over 50 years experience and know-how.

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NEW BEDFORD, MASSACHUSETTS, U. S. A.

Will Age Be An Election Issue?

President gives private assurance of running again . . . Question of age and health will be raised . . . Associates see Ike fit, point to many older men in key posts here and abroad—By G. H. Baker.

• NOW that it's evident that President Eisenhower has privately consented to be the Republican candidate to succeed himself in office, political dopesters are raising the inevitable questions about the candidate's fitness for the man-killing job he holds.

In the months ahead, you can expect to read and to hear reams of political propaganda raising questions about Mr. Eisenhower's health, his age, and his "fitness" for the job.

As a businessman, you should recognize such questions for what they are—wild potshots from the opposite side of the political fence, inspired by candidates and would-be candidates who would pick up votes by raising dark and mysterious hints about the well-being of their rivals.

Call Health Superb . . . Congressmen in close contact with the President and his official family state without hesitation that Mr. Eisenhower is in "superb health" for a man of his 65 years. Evidently, his ability to follow up the hard grind of official duties with the softer hours of golf and fishing accounts in large part for his firm health.

Rep. Oliver Bolton, a second-term Republican from the greater Cleveland area, brands as "nonsense" the new Democrat charge that Ike is "too old" for a second term. (He would be 70 toward the end of his second term.) Mr. Bolton points to a long list of statesmen beyond 70, including Sen. Green, D., R. I. (87); Sen. George, D., Ga. (77); Rep. (and Speaker of the House) Rayburn, D., Tex., (73); Sir Winston Churchill (79); German Chancellor Adenauer (79), and Canadian Prime Minister St. Laurent (73).

And the Democrats may want to forget the "age" issue before long. Two of their congressional kingpins, Senator George and Speaker Rayburn, are up for re-election.

May Ease Tariffs . . . Big-scale tariff reductions are in the works. The White House has ordered foreign trade experts in the State Dept. to start making out a list of products and commodities on which we'll consider trimming the tariffs.

Just how many products will be affected—and how deep the cuts will be—is still a dark secret as far as the State Dept. is concerned. (They're not talking yet.) Industry will have to wait until the multi-nation tariff talks get under way early next year to find out.

The negotiations will be held under the authority of the Reciprocal Trade Act, which Congress renewed last spring for another 3 years. The nations to be involved in the tariff-cutting talks are not disclosed by the State Dept.

Won't Follow Reds . . . Soviet proposals to drop 640,000 men from the Red Army are not going to result in any similar reduction in the U. S. Army, Navy, or Air Force at this time.

President Eisenhower and Defense Sec. Wilson are firmly agreed that Russian leaders will have to make a much better showing of disarmament than this relatively small cut before the United States will consider dismantling its armed strength.

Show Me . . . There are at least three good reasons why the Defense Dept. has adopted this "show me" attitude on the Russian disarmament announcements:

1. The announced reduction of 640,000 means nothing until we know how many are left.
2. The cut probably is in ground

Open Those Elevator Gates

Teen-agers are making headway in their fight to be accepted as young adults, although they still haven't won the vote. The U. S. Labor Dept. has relaxed its rules to the extent of permitting young workers to ride in freight elevators.

Under an earlier order, now rescinded, 16 and 17 year-old-workers were banished from freight elevators, and had to walk or use passenger lifts in factories and office buildings. Unduly restrictive requirement, the Department says now.

But the Department didn't lose its head and go all the way in granting freedom to youths—elevator operators must still be at least 18 years old.

AMERICAN TRUCK CRANES and Crawlers, as well, combine extreme mobility, efficiency and power for construction and industrial work and for many other uses. Today, as for many generations past, American equipment is the top choice of America's most progressive industries.

American DiesELectric cuts costs on new Georgia plant

UNLOADS LONG HEAVY BEAMS FAST AND EFFORTLESSLY

Industry's most-efficient locomotive crane, an American DiesELectric, has proved a major factor in *speeding production* and slashing costs during construction of a new plant at Doctortown, Georgia. For instance, long, heavy steel beams are unloaded from railroad cars with remarkable speed and facility by the American DiesELectric. Whether used on new construction, for handling heavy equipment and supplies at a plant site, or for loading and unloading raw materials, highly-adaptable American DiesELectrics can be the answer to your production problems. Let us show you operating records that prove American DiesELectric Locomotive Cranes can write off their cost in five short years or less. Let us help put your operations on a more efficient basis. For factual information, write American Hoist & Derrick Co., St. Paul 1, Minn.

forces, not in air or naval strength. Russia for years has enjoyed tremendous superiority in ground troop strength, due to gunpoint conscription.

3. How do we know the announced reduction will actually be carried out?

What this means is that the White House and the Pentagon will now watch for concrete evidence of disarmament—not just vague talk, unsupported by evidence. And it also means that the U. S. military machine, built up by brains, sweat, some anguish, and billions of dollars, is not going to be dismantled or hacked away. The defense system was built the "hard way," and Ike and his military leaders have no intention of letting it run down the drain at any time in the foreseeable future.

Fair Trade:

Court rulings, competition weaken practice.

Hard competition for the consumer's dollar is taking more and more starch out of fair trade. And it's coming at a time when backers of the system are getting ready to again defend the philosophy to Congress and the courts.

Fair trade supporters have been battling against discount houses and in many cases department stores since consumer goods became superabundant after the Korean war. But bit by bit, they have seen the system being nibbled away.

The courts have tossed out all or part of fair trade laws in 10 of 45 states having them. It has been upheld in 17 states.

Who Will Follow

How many manufacturers will follow the lead of Westinghouse in discontinuing fair trade as "unworkable" is uncertain. But the firm's decision will not go unnoticed by the U. S. Supreme Court and Congress. The high court begins considering a half-dozen fair trade cases next month, and Congress next year will debate bills on both sides of issue.

Manufacturers who believe fair trade is one of the main bulwarks against price juggling and necessary protection for their brand name good will, as well as retailers who believe it protects them, are going to have to work hard to keep fair trade operative.

Steel Freight Rates

New railroad moves to obtain cuts in rail freight rates on iron and steel articles bound from Southern ports to Midwestern areas are getting a rebuff from the Interstate Commerce Commission.

Cuts of more than 25 pct in charges for some shipments were proposed for ICC approval by rail lines serving South Atlantic and Gulf ports. The decreases would have lowered the 100-lb rate from the ports to Centralia, Ill., from about 96¢ to 69¢.

An ICC examiner recommends to the commission that the new rates be rejected, holding that they are unwarranted. He does not find them necessary from a competitive standpoint.

This action, which puts the fate of the proposal up to the full commission, is eyed with favor by railroads serving ports ranging northward from Baltimore. Rates from Baltimore to the Centralia area are about 93¢ to 96¢ per 100 lb. Charges are slightly higher from New York, Philadelphia, and Boston.

Friendship:

Trade with Reds grows slowly as U. S. eases curbs.

Commerce with Russia and the countries it dominates in Europe is growing slowly, though shipments of U. S. goods to those areas were valued at only $1.6 million in the January-March quarter.

Chief exports from this country have been farm products, such as corn, wet cattle hides, and kip skins. However, under a slightly eased policy, the government will consider applications covering export of conventional passenger cars and of such varied items as aluminum chloride and citric acid.

There is still no trade permitted with Red China.

Unless there is a very considerable change in U. S. policies governing shipments of strategic items, there are many products which the Soviet bloc may never be able to buy here.

Can't Send Arms

The embargo extends not only to arms, ammunition, and implements of war, but also to various atomic energy materials and a large number of items for specialized production.

Machine tools and metalworking machinery, particularly, are banned from shipment. Included are jig boring machines, contour profile grinders, spar millers, armor plate planers, and larger sizes of vertical boring and turning mills, turret and automatic lathes, and forging hammers.

Hard Coal Makes Pig

In an experimental blast furnace at Pittsburgh, the Bureau of Mines recently used a blend of 40 pct anthracite and 60 pct coke from bituminous coal for making pig iron.

Percentage of anthracite used is said to be the largest in modern times. Bureau says the "hard coal" portion seldom has exceeded 10 pct of the fuel charged to a commercial blast furnace.

During the tests, good quality pig iron unusually low in sulphur was made without difficulty. Researchers found little difficulty in operation with any proportion of anthracite up to the 40-60 ratio.

Economic factors were not considered during the test runs, and not all the variables involved in the proportions of anthracite and coke were studied.

Report of the tests is presented in R. I. 5165, Smelting Iron Ore with Anthracite; Bureau of Mines Experimental Blast Furnace. This publication is obtainable from the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13.

You are cordially invited to see
LATEST BAIRD MACHINES and TOOLING IN OPERATION
at the COLISEUM MACHINERY SHOW
Chicago Coliseum, Sept. 6-17, 1955 — **BOOTH 619.**

. . . IF IT'S A HIGH PRODUCTION PROBLEM . . .

ASK BAIRD ABOUT IT

A COMPLETED PRODUCT AT EVERY TICK OF YOUR WATCH . . . OR *FASTER*

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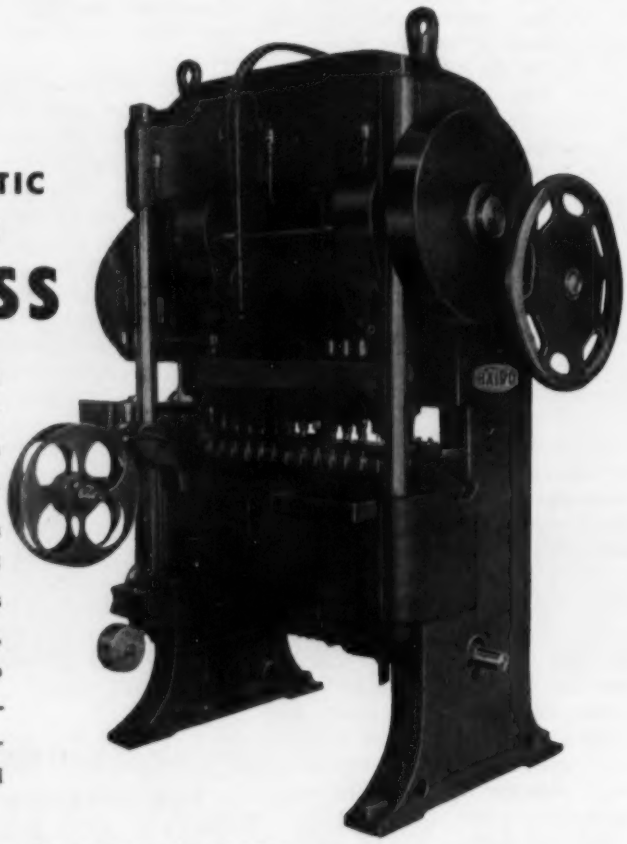
BAIRD AUTOMATIC *MULTIPLE* TRANSFER PRESS



Production of 3000 to 5000 accurately formed metal parts per hour is normal for this completely automatic Baird Transfer Press . . . even though 10 to 14 operations are included in a single cycle.

The machine shown is one of 12 standard sizes that have rated working pressures from 5 to 55 tons. Coiled stock from 2½" to 4" in width is automatically fed and blanks cut therefrom. Then, human-like fingers grip and transfer the blank to successive die stations for drawing, piercing, embossing, slitting, trimming, sizing, hexing, forming, etc. At each stroke of the machine, a finished piece is automatically ejected.

Tooling possibilities are practically limitless . . . with provision for stamping the widest variety of parts . . . for thousands of different uses. Here indeed is high production with lowest unit costs.

For a most favorable competitive position in today's markets, install a Baird Multiple Transfer Press. "Ask Baird about it." Write Dept. IA.

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WHERE YOU WILL GET THE HELP OF SPECIALISTS ON THESE ESSENTIAL PRODUCTION PROBLEMS:

AUTOMATIC MACHINE TOOLS • AUTOMATIC WIRE & RIBBON FEEDS
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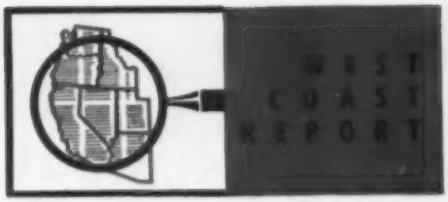


West Expansion Creates New Markets

Above national average population increase guarantees growing consumption . . . Smart metalworking executives are increasing West plant capacity . . . Others moving Westward from East—By *R. R. Kay.*

◆ TAKE ANOTHER look at your sales program. . . . Covering the Farwestern market?

If you want to share the industrial growth here, better start plans soon. If you don't, it's a good bet your competitor will. All over the West, new or expanding companies are showing up almost daily.

Here They Come . . . Here are the latest firms planning to be on the spot as the market develops—they'll not only sell to Westerners, but become customers themselves:

Clark Equipment Co.—will make fork lift trucks at Emeryville, Calif. . . . Screw Machine Products Co.—bought several acres for Portland, Ore., expansion. . . . AiResearch Mfg. Div. of Garrett Corp. —spending $400,000 to enlarge aircraft parts plant, Phoenix, Ariz. . . . International Telephone & Telegraph Corp. — building $2.5 million electronics manufacturing unit in California's San Fernando Valley.

Pfahler Mfg. Corp.—will make gears and gear assemblies in Costa Mesa, Calif. . . . Chemical Salt Production Co., affiliate of Pennsylvania Salt and Hooker Electrochemical companies — $1 million facility at the Great Salt Lake.

Still More . . . Page & Page Co. —expanding its Portland, Ore., trailer-making factory. . . . International Business Machines, Inc.—optioned 200 acres near San Jose, Calif., for future expansion. . . . Becco Chemical Div. of Food Machinery and Chemical Corp. — $1 million addition to its Vancouver, Wash., hydrogen peroxide unit.

General American Transportation Corp. — new facilities near Long Beach, Calif., for nickel plating, steel fabrication, and warehousing. . . . Stephen's Foundries —new non-ferrous foundry in Gilroy, Calif. . . . Western Carbide Corp.—to make hard facing paste at North Hollywood, Calif.

Union Carbide & Carbon Corp. and U. S. Vanadium Co.—both will enlarge uranium processing mills at Uravan, Colo. . . . Sunmaster Products Co. — to open $200,000 plant in San Bruno, Calif., for aluminum ladder production. . . . Varian Associates—adding a $260,000 electronics research building at Palo Alto, Calif.

Kennecott Copper Corp. — $4.7 million addition to ore concentration plant, Hayden, Ariz. . . . Davis Equipment Co. — $200,000 agricultural tool factory, Sunnyvale, Calif.

"Did you enjoy your horseback riding over the weekend Miss Pismo?"

Diversified Industry . . . H-K Equipment Co. — setting up in Portland, Ore., to make industrial valves, large-diameter plastic pipe. . . . Globe Pacific Hoist Co.—will make automotive hoists in a $100,000 unit, Long Beach, Calif. . . . Printasign Div. of Reynolds Pen Co.—to make automatic sign-writing and lettering machines for industry, Pacoima, Calif.

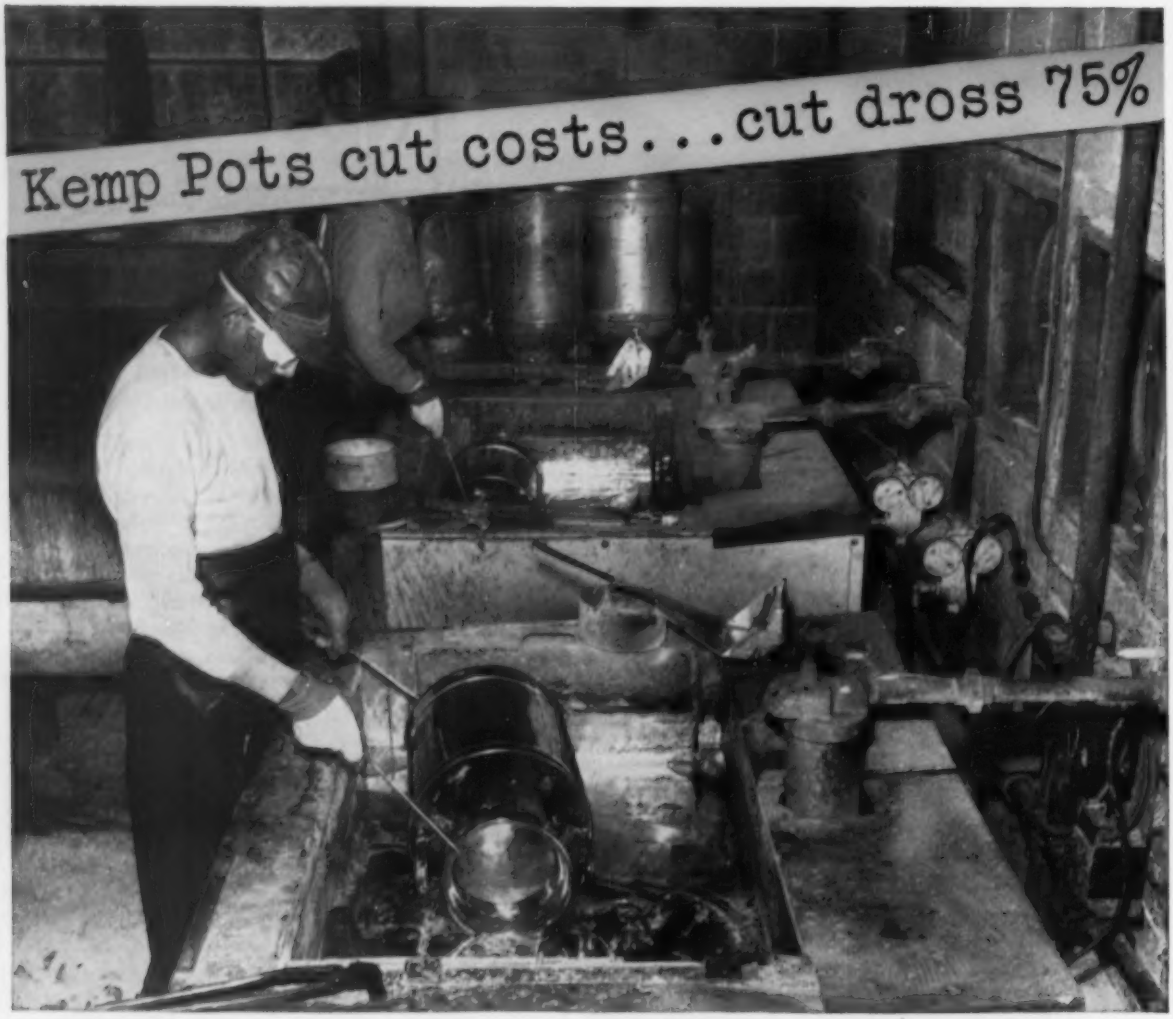
Foil Kraft, Inc. — $1 million plant to make aluminum foil food containers, Los Angeles. . . . Melco Wire Products—new tool and die shop, Glendale, Calif. . . . A. J. Bayer Co.—expanding its Huntington Park, Calif., pressed metal division.

General Water Heater Corp.—building another plant, in North Hollywood, Calif., for wall heater production. . . . San Jose Plating Works — expanding its San Jose, Calif., shop.

Pacific Tap Co.—Burbank, Calif., plant to make taps, do general machine work. . . . Geo. M. Prescott Co. — now making materials handling equipment, Alhambra, Calif. . . . Bell Foundry Co.—added a machine shop to its South Gate, Calif., plant. . . . Fansteel, Metallurgical Corp.—began selenium rectifier assembly in South Pasadena, Calif.

Houdaille Industries of Calif.—will develop aircraft pumps, Pasadena, Calif. . . . Porta Cooler Co.—portable evaporative cooler, Van Nuys, Calif. . . . Anja Engineering Co.—more space for ball point pen parts production, Los Angeles.

Allen B. Dumont Laboratories, Inc., Magnavox Co., and Radio Corporation of America — all expanding Los Angeles electronics engineering and development units.



Springfield Can Co. reports: *Improved retinning quality at lower cost with Kemp Melting Pots*

Retinning dairy equipment is the main plant operation at the Springfield (Missouri) Can Co. Milk cans are treated in a retinning room where 2 Kemp Immersion Heating Pots melt block tin and keep it in liquid form for the operation.

Installed in January, 1955, the Kemp Pots have already proved superior to the old, externally heated pots in quality control. They have reduced dross formation 75%. The constant, even heat of Kemp Pots helps produce heavier tin coatings, which give the retinned cans the quality appearance and life of new cans.

Kemp Saves Fuel, Production Time

The Kemp units heat much faster than old-fashioned methods and maintain an even temperature. This means lower fuel costs as well as valuable production time saved. Mr. Jack Simon, Springfield Can Co. owner, sums it up by saying, "The Kemp Melting Pot is the finest produced!"

Kemp Can Help You

You benefit in many ways when you install Kemp Melting Pots: they are not subject to periodic and expensive breakdowns . . . offer greater heating surface, faster heat recovery, lower dross formation, even lower room temperatures—they operate continuously at maximum efficiency with a substantial saving in fuel costs.

Find out how Kemp engineers can provide the most profitable solution to your heating or melting problem. Write for Bulletin IE-10 today.

KEMP OF BALTIMORE

IMMERSION MELTING POTS

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THE C. M. KEMP MFG. CO.
405 East Oliver Street, Baltimore 2, Maryland

Visitors, Exhibitors Learn at Show

Need for standardization of tape and punch card machines is apparent . . . Exhibitors find appearance is sales factor . . . Operating displays bring results and possible sales—By *E. J. Egan, Jr.*

◆ PROSPECTIVE BUYERS of tape and punch card controlled machine tools are beginning to think about standardization of these components. Many Machine Tool Show visitors who might be able to use a variety of information-feed-in equipment were speculating about the number of devices they'd need to prepare the several forms of cards, tapes and film strips now in use.

The situation was clearly pointed up by two neighboring displays at Chicago's International Amphitheatre last week. Both machines were being put through their paces by ribbons of punched tape. In one case, the tape strip was less than an inch wide and the holes were quite small. Tape for controlling the other machine tool was about four inches wide with correspondingly larger holes.

It's obvious that two hole-punching machines would be required in a metalworking shop using this pair of machine tools, hence the demand for standards in data processing equipment.

Overseas Interest . . . Interest of the many foreign visitors came as a pleasant surprise to Machine Tool Show exhibitors. Outstanding in a large list of showgoers from overseas was a 10-man delegation from Buenos Aires. The leader of the group would talk only with the sales manager of each company booth that was visited, and he was perfectly content to wait if necessary.

When the group leader finally met and talked with the sales manager, other members of his group stood close by, listening intently. When the conversation ended, all 10 of the delegation bowed politely and the leader directed his group to a new point of interest. None of the group members spoke a word but the "head" man. However, nine pairs of eyes and ears looked and listened to everything that was done or said.

"I've never had so much concentrated attention," one sales manager told THE IRON AGE.

Another Argentinian visitor was a machine tool distributor in that country. He already represents two American firms there and was hopeful of lining up another reputable source or two before he returned home. When queried about the Latin American market potential for metalworking equipment, he maintained that in his opinion it was excellent.

"YOU know the rules. No pets."

Like Special Purpose . . . He qualified his statement to some extent by saying that he referred mostly to special purpose machines. Argentinian builders already make many of the so-called standard lathes, shapers, drilling machines and milling equipment. Because of the money exchange situation, domestic metalworking plants are obliged, for the most part, to buy these locally-produced tools.

Sales Factors . . . Builder reaction to the interest shown by all show visitors was uniformly enthusiastic. The sales manager of one firm with a large and costly exhibit told THE IRON AGE that the number and quality of inquiries received on opening day was sufficient to justify his company's participation. A large gage manufacturer made a point of counting opening-day traffic through its booth, clocked 7000 persons who stopped, looked and listened between 10:00 a.m. and 5:00 p.m.

A number of builders commented that streamlined machine tool design for more eye appeal cannot be discounted as a sales factor. Swarms of visitors seemed to be constantly attracted to sleek, purposeful - looking equipment wherever it was in operation. Most exhibitors also learned that it paid to keep their machines operating as continuously as possible.

"People are really serious about seeing these things at work," one said. "Even if the operator just steps away for a drink of water the crowd takes off for another display."

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The Iron Age SALUTES

William E. Rutz

His work as chairman of the committee for the Chicago Show contributed greatly to the success of the event and rates the thanks of the nation's machine tool builders and users.

When problems arose in preparations for the Machine Tool Show, the man they turned to was Bill Rutz. Chairman of the Show Committee for National Machine Tool Builders Assn., Mr. Rutz coordinated the vast activities that brought the show to life. Success of the event is a tribute to his effective handling of this big, tough job.

In the early stages, there was the question of where the show would be held. Vice president and works manager at Giddings & Lewis Machine Tool Co. for 20 years, Mr. Rutz could speak with authority on requirements for a hall that would house machine tools. He knew there would be models weighing over 100 tons; he saw that proper accommodations were provided.

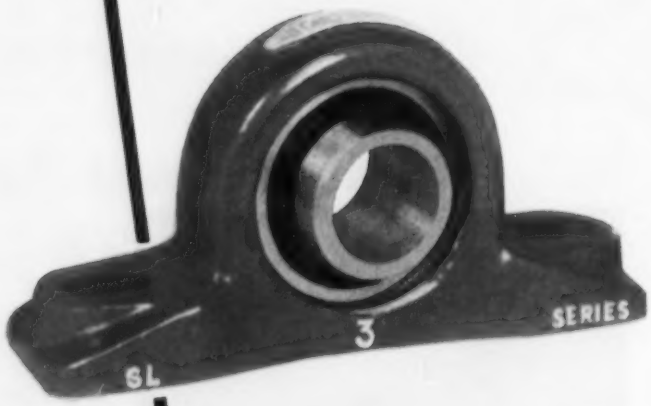
Then the hall had to be outfitted for tool operation. Over 500 machines were displayed, and a good part of them were working on jobs. Questions of power supply, water and air pressure found Mr. Rutz well able to advise on show needs. He has been around machines practically all his life, studied engineering by mail, has traveled abroad to observe tools and methods. No detail was overlooked in readying the Amphitheatre.

He was well qualified technically to head the show committee but the job called for more than technical knowledge. With over 175 companies exhibiting and ticklish questions of space, position and display style to be resolved, the man with the big say had to be a leader, a diplomat and a judge. Bill Rutz had the right combination. He is a pleasant man, interested in others and good at directing group action. He served 2 years as president of the Wisconsin Chamber of Commerce, was a director of the Wisconsin Blue Cross, has long been active in Rotarian and other civic work.

The sheer volume of work demanded by the show would have snagged many men. Fortunately, Bill Rutz is energetic and gets good mileage out of his efforts. During show preparations, he made regular flying trips to NMTBA headquarters in Cleveland, keeping on top of details, disposing of problems as they arose, pushing the project along on schedule.

Mr. Rutz was born in Fond du Lac, Wis., and has centered his activities around that area. He likes music, playing the violin, and has had good success with flower gardening.

IT'S NEW IT'S POLLARD SELF-LUBE



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SUITABLE FOR ½" SHAFT DIAMETER TO 6" SHAFT DIAMETER IN ½" STEPS.

The POLLARD "SELF-LUBE" sealed bearing design offers the MAXIMUM duty, for the MINIMUM of attention and outlay. It can be stated that 90% of bearing failures are due to the ingress of foreign matter, and by reason of the great strides which have been made in the manufacture of special lubricants, it has been possible to provide a bearing mounting requiring no servicing whatsoever. The one piece housing and solid sleeve, enables the bearing to be fitted as a complete unit, there by eliminating the hazards of an exposed bearing. Further, the improved sealing devices are of the flexible type bonded to a metal insert, ensuring long trouble free service and are not called upon to align themselves to the malalignment of the bearing housing. This bearing unit gives a life equal to, or greater. than the standard open type bearing of similar size, period'cally lubricated, and is available from ½" to 6" shaft diameter. Flange units incorporating the same advantages as outlined above are also available. The lower drawing, illustrates the flange unit design. Catalogue SL/2/54 giving further details is available on application to Room B.2. Technical Sales Dept. London, England, or Montreal.

The Iron Age INTRODUCES

J. C. H. Stearns, elected to new office of executive vice-president, **Dow Chemical International Ltd.** and **Dow Chemical Inter-American Ltd.,** Midland, Mich.

R. B. Butler, appointed sales manager for Research Industrial Div., **The Garrett Corp.,** Los Angeles.

R. C. Somerville, appointed executive director of markets, **Chrysler Corp.,** Detroit.

W. D. Kleppinger, elected vice-president of Chemical Equipment Div., **General Ceramics Corp.,** Keasbey, N. J.

R. E. Wagenhals, named sales forecast manager for the **Timken Roller Bearing Co.'s** new sales forecast Dept., Canton, O.

J. P. Butler, appointed to newly created post of assistant to the president, **The Beryllium Corp.,** Reading, Pa.

G. H. Hille, appointed sales engineer for **Mallory-Sharon Titanium Corp.,** Niles, O.

H. D. Cunningham, promoted to newly created post of general traffic manager, **Goodyear Tire & Rubber Co.,** Akron, O.

H. G. Warner, appointed works manager, Cadillac Motor Car Div., **General Motors Corp.,** Detroit.

N. A. Price, named vice-president and director of **Colson Corp.,** Elyria, O.

J. C. Franklin, appointed assistant group executive on administrative staff of eastern divisions of **Bendix Aviation Corp.,** Teterboro, N. J.

W. L. Kimber, promoted to district manager for Buffalo office of **Leeds & Northrup Co.,** Philadelphia.

B. E. Phillips, named assistant sales manager of the Industrial Truck Div., **Clark Equipment Co.,** Battle Creek, Mich.

P. F. Pardonner, named manager of Detroit sales district, **Armco Steel Corp.,** Middletown, O.

D. R. Meckstroth, has joined **Westinghouse Electric Corp.,** as manager of marketing services for air conditioning division, Staunton, Va.

John Rundt, appointed chief engineer and **Alva Kopatz,** chief draftsman for Div. of Research & Development, **The Timken Roller Bearing Co.,** Canton, O.

K. O. William Sandberg, appointed manager of General Electric Plastics Dept.'s Decatur, Ill., custom-molding plant, **General Electric Co.,** Pittsfield, Mass.

J. D. Herman, named chief chemical engineer, **G. A. Munson,** chief mineral engineer, and **John Talley, Sr.,** branch manager, **Lithium Corp. of America, Inc.,** Minneapolis.

G. L. ABBOTT, elected chairman of the board of directors, The Garlock Packing Co., Palmyra, N. Y.

R. M. WAPLES, elected president, The Garlock Packing Co., Palmyra, N. Y.

J. H. HARRIS, promoted to vice-president, Brush Electronics Co., Cleveland.

D. B. PARKINSON, promoted to vice-president, Brush Electronics Co., Cleveland.

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A. W. MacLaren, appointed metallurgical engineer - alloy steels; **J. R. Hamilton,** assistant metallurgical engineer - structural; **P. R. Wray,** assistant chief metallurgical engineer, **United States Steel Corp.,** Pittsburgh.

M. T. Sprague, named Oakland Calif., district manager for **International Harvester Co.,** Chicago.

L. R. Oswald, appointed Chicago district manager, Edison Storage Battery Div., **Thomas A. Edison, Inc.,** West Orange, N. J.

C. J. Gross, promoted to manager of Export Div., **Combustion Engineering, Inc.,** New York, and **F. J. Bader,** promoted to assistant general sales manager for New York office.

L. H. Lundstedt, appointed sales representative for **Youngstown Steel Tank Co.,** Youngstown, O.

A. A. Mann, named factory manager of **Hyster Co.,** Peoria, Ill.

W. W. Kingman, appointed to executive post on industrial sweeper sales staff of **Wayne Mfg. Co.,** Pomona, Calif.

W. C. Truckenmiller, appointed assistant technical director, **Albion Malleable Iron Co.,** Albion, Mich.

B. S. Brallier, named technical adviser to the president, **Stauffer Chemical Co.,** New York.

J. V. Corr, appointed assistant vice-president, sales; **W. G. Gerstmeyer,** assistant manager, and David McFarland, resident manager of Toledo sales office, Great Lakes Steel Corp., Div. of **National Steel Corp.,** Detroit.

L. A. Fugassi, appointed assistant chief engineer; **J. M. Bendot** appointed chief draftsman; **J. W. Martt,** assistant chief draftsman, and **L. J. Baird,** development engineer for Weirton Steel Co. Div. of **National Steel Corp.,** Weirton, W. Va.

R. T. LUND, appointed vice-president of National Carbide Co., Div. of Air Reduction Co., Inc., New York.

R. J. WEAN, elected a director of The Federal Machine & Welder Co., Warren, O.

G. E. ELLIS, appointed general sales manager, Lipe-Rollway Corp., Syracuse, N. Y.

J. P. BANKSON, appointed sales manager for Shenango-Penn Mold Co., Pittsburgh.

What shape is a quality fastener?

Here is a handful of ELASTIC STOP® nuts. Each has ESNA's familiar red locking collar . . . is self-locking and vibration-proof. Each is a readily assembled, one-piece unit. Each provides positive protection against thread corrosion . . . prevents liquid seepage along bolts. Each is made from the finest of raw materials. Each is exactly controlled as to finished dimensions, class of thread fit and finish. Each is now in use on critical applications, with a record for uniform high quality that is unmatched.

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Please send the following free fastening information:

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PERSONNEL

Christian Van Raaphorst, appointed plant superintendent at Waterbury Mfg. Co., Div. of **Chase Brass & Copper Co.,** Waterbury, Conn.

W. R. Alexander, appointed director of engineering, **The Steel Products Engineering Co.,** Springfield, O.

John Cameron, named assistant chief engineer, Hamilton mechanical presses, Hamilton Div., **Baldwin-Lima-Hamilton Corp.,** Hamilton, O.

W. L. Hardy, appointed business research manager by **Norton Co.,** Worcester, Mass.

K. S. Patton, appointed sales representative for Oklahoma City sales office of Laclede-Christy Co.; Div. of **H. K. Porter Co., Inc.,** St. Louis, Mo.

J. W. Hall, named director of advertising and sales promotion for **National-U. S. Radiator Corp.,** Johnstown, Pa.

Erskine Fraser, named sales representative of new Atlanta sales office for the **L. B. Foster Co.,** Atlanta, Ga.

Dan Rosenman joins **Brach Mfg. Corp.** as sales manager of the eastern division, Newark, N. J.

A. B. Hughes, appointed abrasive engineer for eastern district of **Bay State Abrasive Products Co.,** Westboro, Mass.

OBITUARIES

B. L. Montague, founder and president, **The B. L. Montague Co.,** Sumter, S. C.

T. C. Phillips, 54, vice-president-sales, **Pittsburgh Steel Products Co.,** Pittsburgh.

M. P. Cortilet, 59, vice-president, Central Div., **American Can Co.,** Chicago.

H. T. DeRemer, works manager, **Selas Corp. of America,** Philadelphia.

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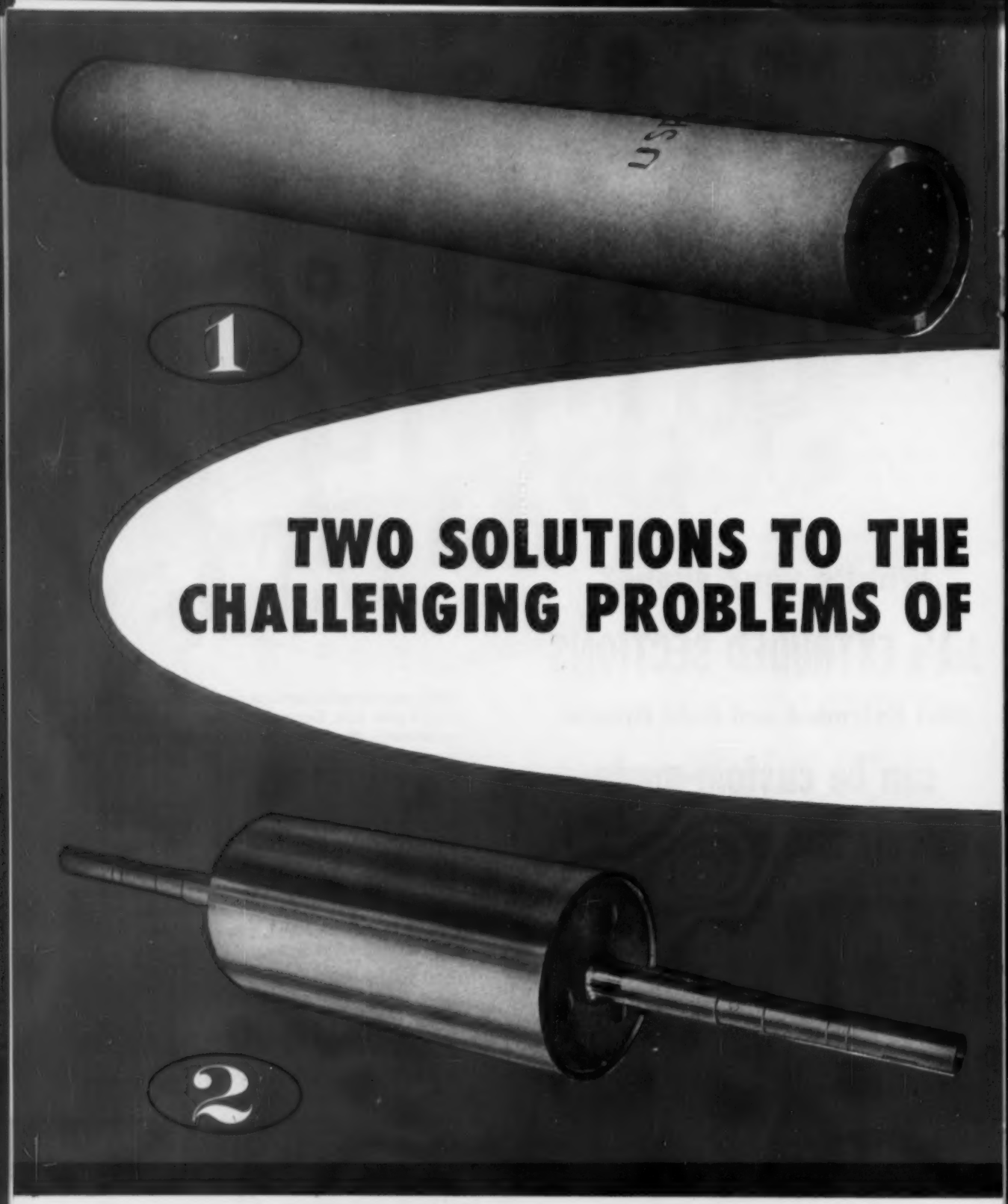

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UNITED STATES PIPE & FOUNDRY CO.

Special Products Division

BURLINGTON, NEW JERSEY

SALES OFFICES: LOS ANGELES, CHICAGO, ST. LOUIS, CLEVELAND, DETROIT, PITTSBURGH, HARTFORD, BURLINGTON

HIGH TEMPERATURE

SOUNDNESS AT 2150 F.

1 Because of their inherent soundness, metal mold centrifugally cast retorts give longer operating life at extreme temperatures. These retorts have been tested in service under the most adverse operating conditions, and field performance data prove their superiority conclusively.

Centrifugally cast stainless steel retorts are used by the New England Lime Company of Canaan, Connecticut to produce high purity magnesium metal by thermal reduction. Their retorts are operated 24 hours a day at 2150° F. under a high internal vacuum — a test only the ultimate in soundness and quality could survive.

SURFACE AT 1400 F.

2 The Selas Corporation of America, one of the nation's leading industrial furnace builders, demands a high order of quality in the stainless steel rolls used in their continuous strip annealing furnaces. Perfect roll surfaces are a "must". The slightest surface imperfection in the strip will cause rejection.

Long, trouble-free life, at extreme temperatures, is assured because of the dense, flawless roll surface made possible by the metal mold centrifugal process.

In cylindrically shaped sections, U. S. Pipe offers a wide range of sizes in electric furnace alloys for many difficult and exacting applications.

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The Iron Age
FOUNDED 1855
TECHNICAL ARTICLES

By W. G. PATTON, Engineering Editor

Study service loading—

Stress Analysis Takes Guesswork Out of Product Performance

◆ Do you make—lawnmowers? . . . Or locomotives? . . . Whatever your product, modern stress-analysis techniques might show you how to build it more economically . . . And make it serve your customers more dependably, too.

◆ A stress-analysis program eliminates design guesswork on Ford Tractor Div.'s farm implements . . . This typical case history shows how laboratory and field tests resulted in a much-improved hay rake design.

◆ MEASURING ACCURATELY the intensity—and the frequency—of severe service loading is the objective of a broad research and development program being carried out by Ford Tractor Div., makers of farm and industrial tractors and farm implements.

Using modifications and simplifications of techniques once employed almost exclusively by the aircraft industry, the new program is already paying dividends in the form of (1) greater dependability of products in service; (2) better product performance; (3) substantial weight savings (which mean reduced manufacturing and operating costs); and (4) a steady increase in the knowledge of how metal-parts assemblies behave under service conditions.

To illustrate the last point, the research program has already yielded much valuable information on stress effects in welded sections, on concentrations around hole areas, and in other regions of vital significance to the design engineer.

Helps design engineer

Dependable, precise knowledge—not guesstimates—of the behavior of materials under stress, plus the steady accumulation of data showing the frequency with which heavy loading occurs, is expected to give Ford engineers a new design tool. Used properly, it should (1) reduce the time required for new product development, (2) simplify materials selection, (3) cut the cost of materials, and (4) effectively reduce failures in service.

The Ford experimental stress analysis pro-

gram, perhaps better described as a strength analysis program, fills a vital need for a manufacturer of farm equipment. The company both produces and buys farm implements and currently markets more than 100 pieces of equipment. Therefore, test methods must be fast, reliable and not too expensive.

It is fairly obvious that heavily loaded farm equipment, working over uneven terrain, is subject to many different combinations of severe stress. These stresses are repeated many thousands—sometimes millions—of times. Most failures occur as a result of fatigue—from repeated alternating stress. For this reason, it is important to know not only the intensity of the load but also the frequency with which such loading occurs.

Tests yield valuable data

The best way to understand what Ford test engineers are doing is to take an actual implement and follow the laboratory and field test procedures from the prototype to the final product. The product chosen is a rotating side delivery hay rake. It was selected because the testing program yielded an unusual variety of data, including the effects of repeated alternating stress on welds and bolt holes.

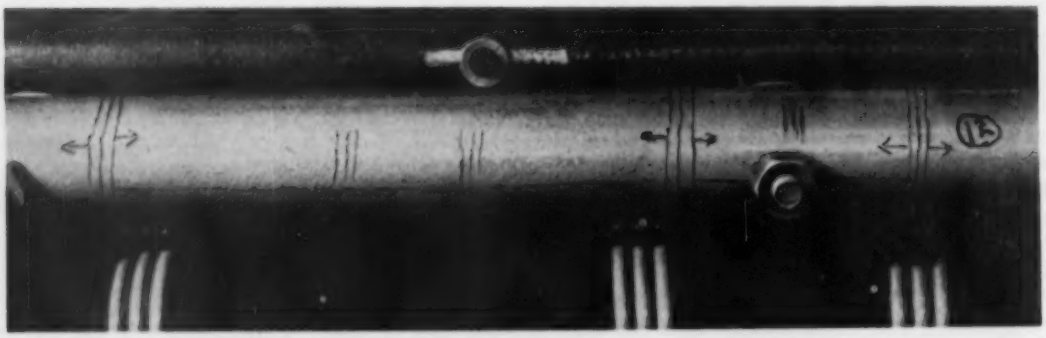
Some of the stress problems on this particular implement resulted from lack of stiffness in the original design. This study shows how strength-testing revealed this, and also describes some of the benefits that resulted, for example, when a heavily stressed rotating member was changed from a round to a square.

It is interesting to observe that although the prototype model was purposely built on the light side for more effective evaluation of strength requirements, the final redesigned item (after stress analysis) was more than 20 pct *lighter* than the original. Actual weight savings totaled 80 lb.

Generally speaking, the firm's approach to strength analysis involves three types of tests: (1) stress-coating to determine areas subject to high stress concentration, (2) extensive use of strain gages to measure the intensity of localized stresses, and (3) tests to evaluate the properties of the structural materials involved.

After these determinations are made, actual load measurements are compared with the observed properties of the material under fatigue loads. Data derived from tests are then applied

SEVERE impact loading stresses on assemblies may produce stress patterns in lacquer coatings such as these which developed in the original caster wheel supporting member.



FLUCTUATING bending loads on Stresscoated tubular tooth bar caused these fatigue cracks to appear. Tubes were later replaced by square members which did not require hole drilling.

IN WELDED sections the heat-affected zone just outside the weld may be a critical area. With low carbon steel used here, hardenability was probably not a major cause of cracks.

to parts through the use of extrapolation methods used in conjunction with a modified Goodman Diagram.

Prior to testing, Ford engineers apply loads in the laboratory that simulate service loading. This is done to relieve, at least partially, some of the stresses that may be built up during fabrication. The practice has been helpful in avoiding wrong or misleading conclusions that might otherwise be drawn from the accumulated test data.

Experience has shown that Stresscoat lacquer with a sensitivity factor of approximately 0.0006 in. per in. gives satisfactory and consistent results in pinpointing highly stressed areas. The lacquer, a product of the Magnaflux Corp., is selected for the job on the basis of its sensitivity to temperature and humidity. Several types are available for use in the temperature range from 5 to 130°F.

Stresscoat is generally applied to the test parts by spraying, and efforts are made to keep the humidity as near constant as possible. At the same time the test pieces are coated, ¼ x 1 x 12-in. calibration bars are also sprayed.

After placing the test bar in a fixture, load is applied as a cantilever beam. Then after a known deflection is produced in the bar, the strain pattern, reflected by cracks in the coating is observed. The first crack in particular reflects the threshold sensitivity.

Watch threshold sensitivity

The test engineers aim to produce a threshold sensitivity of about 0.0006 in. per in., although this may go down as far as 0.0004 or as high as 0.0008 in. per in. If too low a sensitivity is used, crazing will occur in the lacquer coating; if sensitivity is too high, either too much load must be applied to produce the first crack or the crack may close after the load is released.

One of the first laboratory tests on the lacquer-coated hay rake involved dropping it to the floor from various heights up to an 18-in. maximum.

Effects of drop and other tests on Stresscoated components are shown in accompaying photographs which were taken at certain critical areas, including holes, welds and attachments. Cracks in the coating have been retouched with crayon to mark them more clearly.

Another series of tests involved dropping the prototype rake on a cement floor until its tines began to deflect. Next the rake was pulled at 5 mph, scraping the tines on the ground. As a result of this treatment cracks developed in the center section of the round tooth bar.

Another test involved driving a tractor at 5 mph, with the attached rake straddling and bumping 3 lead weights in line to simulate the tines hitting irrigation borders, clods of dirt or rocks. This caused stress through the entire length of the tooth bar.

Still another test involved operating the tractor at 5 mph with rake tines deflecting against cement and the left end of the rake jolting over a line of 100 lb weights. This also simulated the shock of hitting rock or clods of dirt. This test was also repeated on the right side of the rake.

Having determined the critically stressed areas by means of tests with the lacquer coating, strain gages were then used, both in the laboratory and in the field, to measure the loads. Gages were applied perpendicularly to the crack lines, of course.

During field tests the round iron pipe member originally used for a tooth bar showed evidence of fatigue around the tine holes. Examination also showed that due to misalignment, bending and torsion stresses were produced in the rake. Normal operating speed of the rake reel incidentally, is 60 to 80 rpm.

As a result of the extensive laboratory and

ORIGINAL hay rake with critical members wired to transmit strain gage signals during field tests. Parts which showed inferior fatigue resistance were later redesigned.

FINAL design resulting from lab and field tests is 80 lb lighter, much stronger than original. It has more bracing, square tooth bars without holes and a stiffer reel plate.

field tests program the following design changes were made:

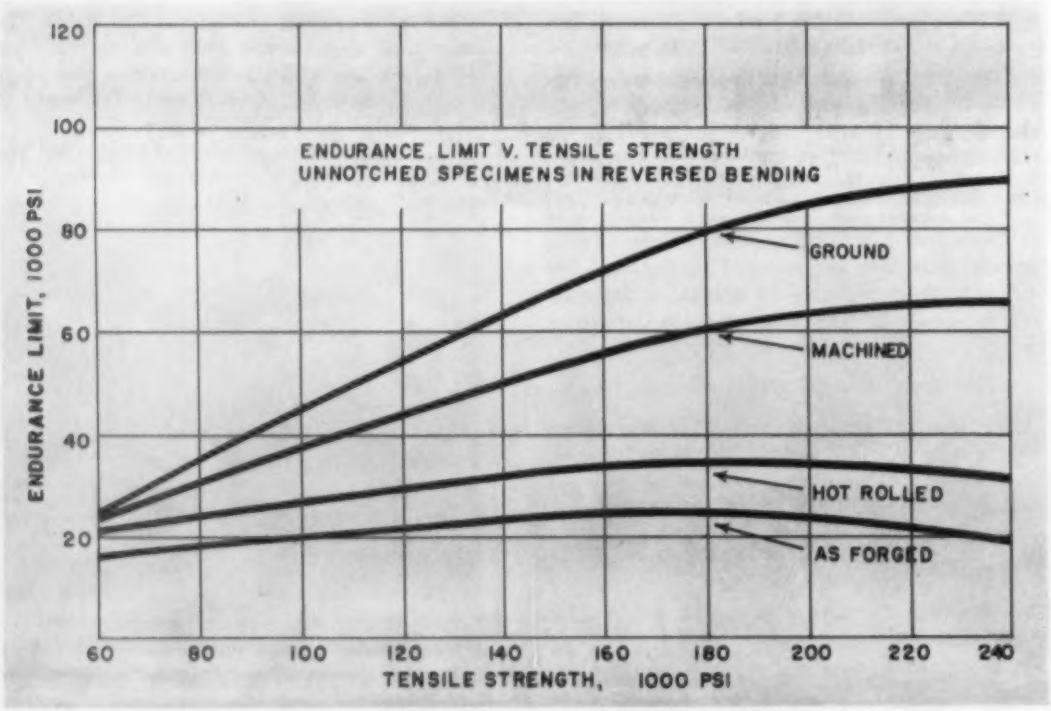
1. Extra bracing was added to the frame.
2. The outrigger design was changed.
3. To insure proper stiffness of reel plates, flanges were added and the hub was stiffened.
4. Square tubing was substituted for round pipe in the tooth bars. This not only saved 8 lb of weight per bar but also eliminated the need for holes that might be subject to fatigue failure as a result of actual operating conditions.

Following the static strain gage testing, a number of measurements were made under field conditions to determine stresses in moving parts. For example, to measure stresses in the tooth bar, two sets of slip rings were necessary —one from the tooth bar to the reel plate and the other from the reel plate to a stationary point where electrical leads are attached.

Ford Tractor Div. engineers designed and fitted out a traveling laboratory to conduct field tests such as these. The mobile equipment can simultaneously record momentary loading stresses from 18 different locations. The truck-borne lab is also available to conduct stationary tests, if desired.

Having thus measured actual stresses at various locations, the next step was to translate this information into practical material specifications. In this connection, the accompanying chart, compiled from the literature and laboratory tests, helps engineers in determining the relationship of endurance limit and tensile strength. Its curves show the result of reversed bending on unnotched specimens in the as forged, hot rolled, machined and ground condition.

Final phase of the laboratory test program is to evaluate the working stresses in terms of the allowable stresses of the material. All laboratory findings are confirmed by field tests before Ford implements are released for production.



No leaks at 2100 psi—

Metal Oxide Sealer Effectively Impregnates Castings

◆ A fast-acting metal oxide type sealer teamed with a high-speed washer-drier unit enables aluminum diecastings to be impregnated at rates up to 600 per hour . . . The castings withstand pressure to 2100 psi without leaking.

◆ The sealer actually enters the micropores . . . Chemical reaction between the metal oxides in the sealer and the parent metal forms a strong metal-to-metal bond . . . It can be easily flushed from the surface but resists removal from the pores.

By W. J. GRASSBY,
Superintendent,
Diecast Mfg. Div.,
Bendix Products Div.,
South Bend, Ind.

◆ A RECENT TREND among manufacturers using large quantities of castings which must withstand air, oil, gas or other fluid pressures has been the impregnation of their total production with metal oxide type sealing materials.

Typical of this trend is the full-production impregnation program specified for an aluminum diecasting produced by Bendix Products Div., South Bend, Indiana. The production setup includes a standard conveyor-washer which has been modified to convert it to a high-speed washer-drier unit. It uses a fast-acting oxide type seal to speed the impregnation operation.

Results with the unit have been very good. It is capable of high quantity production, processing up to 600 pieces per hour with a simple equipment arrangement. All castings processed in the unit acquire positive pressure resistance at the exceptionally low cost of 7¢ per casting. This was the total impregnation cost as calculated in a pilot production test operation.

The diecasting is a master cylinder housing for an automotive power brake. It weighs approximately 1¼ lb. This casting must be capable of withstanding hydraulic fluid pressures, under surge conditions, as high as 2100 psi without leaking.

Microscopic porosity in the walls of an otherwise sound casting is the basic cause of leakage where a component is exposed to fluid pressure. Castings which leak from cracks, blowholes, incomplete section thickness and other

"The metal oxides in effect become part of the casting, making impregnation permanent . . ."

causes are generally considered unreclaimable scrap parts and are usually remelted. Control of microscopic porosity therefore, produces direct control of the pressure-resistant properties of the casting.

Development of the impregnation program for the Bendix master cylinder housing has been carried out by Prenco Products Corp., Hazel Park, Mich. It also engineered and redesigned the standard conveyor-washer unit to produce the prototype high-speed washer-drier unit and performed an extensive pilot production operation.

The part is small enough to permit batch impregnation in an autoclave. Equipment required for batch impregnation consists of a controlled-temperature reservoir, autoclave, rinse tank and a combination washer-drier unit. With just one man operating this line, production averages between 2000 and 3000 castings per day. A two-man operation can double production.

About 500 castings are placed in the autoclave at one time. Vacuum of more than 29.5 in. Hg removes a maximum of the air which may be entrapped in the microscopically small pores in the casting walls. The vacuum is drawn in just 6 minutes, but is held for an additional 14 minutes to allow for complete air removal. This thorough purging of the pores permits maximum seal penetration during the impregnating step.

Following the 20-minute vacuum cycle, heated Porlox seal is admitted to the autoclave and circulated under 110 psi pressure for 20 minutes. The seal actually enters the minute openings in the casting wall. Within each pore, an instantaneous chemical reaction between metal oxides in the sealer and the parent metal of the casting wall forms a metal-to-metal bond which closes the opening.

The reaction between cast metal and metal oxides continues for months, progressively increasing the strength of the bond. The metal oxides in effect become part of the casting itself, making impregnation permanent. Such impregnation is generally capable of withstanding any pressure that the casting itself can withstand.

After the seal has been pumped back to the reservoir, castings are removed from the autoclave and submerged in a cold water rinse tank to remove excess sealer. A unique characteristic of a metal oxide type sealer is that it can be readily flushed off the surface of the part, yet resists all efforts to remove it from the microscopic pores of the casting walls once the chemical reaction has taken place.

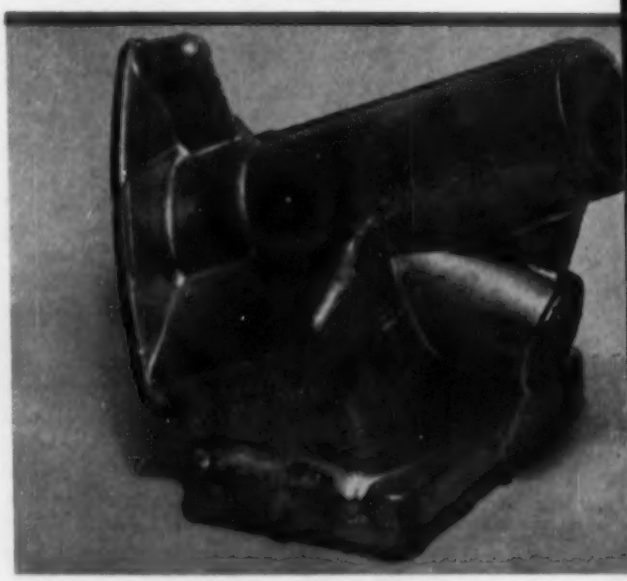
Following the cold water rinse, castings are placed on carrier hooks of a chain-driven conveyor which transport the parts through the combination washer-drier unit. The conveyor is equipped with a variable speed drive which permits setting up the line for optimum efficiency. It also lends flexibility to the line for other castings which may require more or less wash-dry time because of their size or shape variations.

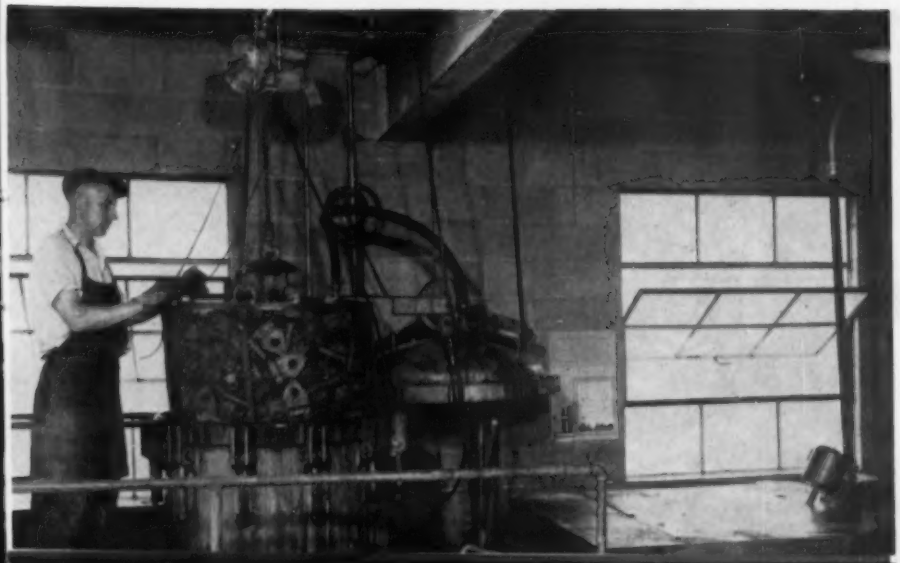
The washer-drier unit, a modification of a standard conveyor-washer, is compact, yet capable of high-speed washing and drying. Its use eliminates the need for an oven-type drier. Although only 4 ft long, 3 ft wide and 5 ft high, the unit can process up to 600 impregnated castings per hour.

Washer nozzles are strategically placed to individually spray each hole cavity of the part as it passes through the unit. The washing medium is hot water containing a special wetting agent for more thorough washing. Even blind holes are washed perfectly clean. The wetting agent also permits water to drain off more readily as the conveyor carries them from the wash tank. As the castings approach the discharge chute, they are exposed to a high velocity blower for further drying.

Drying is critical with aluminum diecastings because aluminum oxide will form within 15 minutes on damp castings.

IMPREGNATION of this aluminum diecasting with a metal oxide type sealer enables it to withstand pressures up to 2100 psi without leaking.





CASTINGS being lowered into autoclave will undergo a 20-minute vacuum cycle before impregnation. Batch treatment handles about 500.

OPERATOR loads compact washer-dryer unit with impregnated castings. Hot water spray contains a wetting agent to speed washing and drying.

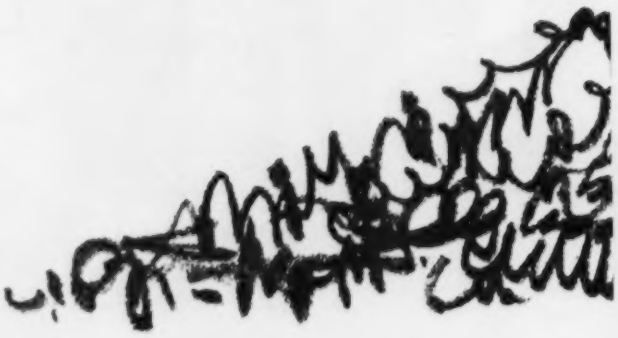
PROCESSED castings drop from chute of washer-dryer unit at rates up to 600 per hour. Unit has variable speed drive to vary the cycle.

Loading more compact—

SAVINGS

Pay For Chip Processing System

♦ Savings obtained from a well-planned chip processing system are expected to pay for the installation in two years . . . Only one short under floor conveyor is needed . . . Cleaned and crushed chips are blown directly through pipes into freight cars . . . Processed chips command higher prices, permit more to be loaded per car . . . Cutting oil recovery is about 80 pct.

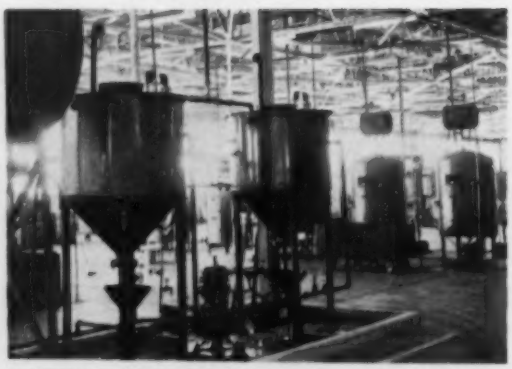


♦ CHIPS are a headache in many plants but a good processing system can be made to pay for itself within two years and return a handsome profit after that if a good choice, with an eye for economies, is made. This is the conclusion reached by the management of the new Decatur, Ill., plant of the Marvel-Schebler Products-Div., Borg-Warner Corp.

This plant, designed and equipped from the ground up to build automatic transmissions, with plenty of experience serving as a guide, has now been operating for about a year and is rapidly reaching peak production although manned by an originally green crew save for a few top executives.

Studies of chip collection and processing systems in similar plants were made but no equipment was purchased until evidence clearly indicated that each unit would be amortized quickly out of savings. Since this is a large plant and the area for chip processing is next to a siding at one end, long trench conveyors would be needed if used for all chip collection. Also, studies pointed to high maintenance costs for this type of equipment as well as a high initial cost.

Because of this only one short trench conveyor for carrying steel chips from a row of automatic screw machines was installed. The delivery end of this conveyor dumps into a hopper and then into portable containers like those used for collecting other chips. Filled containers are towed to the processing area for dumping.

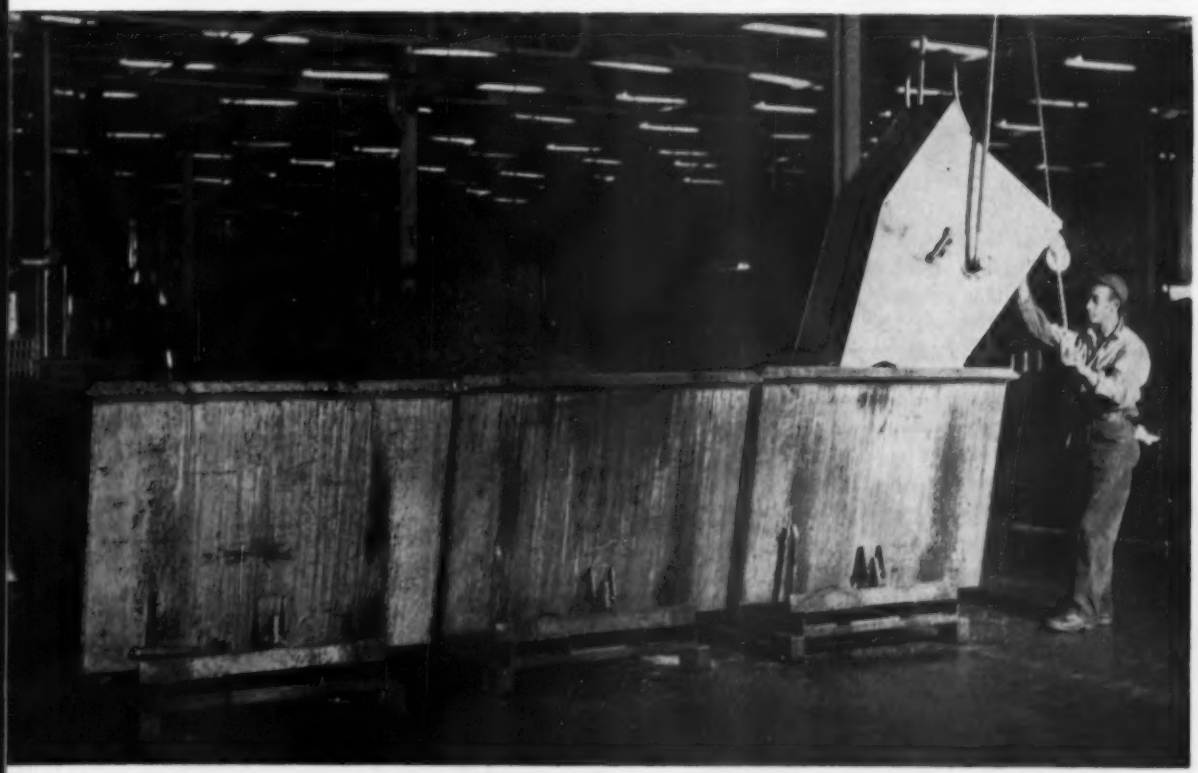


CUTTING OIL is sterilized in these cone-bottomed tanks, after separating from water. New oil is added to improve viscosity and sulphur content.

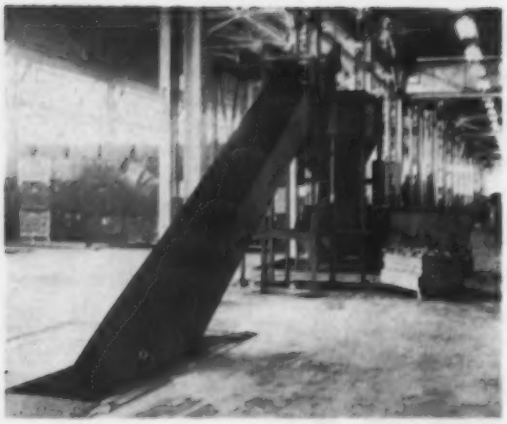
Chips produced by other than screw machines are collected in hand carts by a small crew that circulates as needed. These carts are dumped into the larger containers, using a power hoist. The large towing containers seldom need dumping more than once a shift. They are spotted close to machines so that hand cart routes are short.

No processing is done on aluminum chips since their volume is small and there is a good

By **HERBERT CHASE**, Consultant,
Forest Hills, N. Y.



CENTRALLY spotted towing containers are filled with chips collected in hand carts and elevated by a power hoist. No long trenches are used.



SHORT trench-type conveyor, the only one in the plant, serves automatic screw machines, discharges steel chips to hopper shown above.

local market for them as produced. Volume is much larger on cast iron and steel chips, with 37.5 lb of cast iron and 28 lb of steel chips generated per transmission.

All ferrous chips are taken to the processing unit and dumped into chip chutes, the cast iron and steel chips being separated.

Large steel pieces rejected

Steel chips from the chutes slide or are shoveled into the conveyor, a part of which is below floor level. This conveyor elevates the chips into a crusher from which they are fed into a hopper and later transferred to an extractor. Any large pieces of steel are automatically ejected from the crusher with only chips broken up by the crusher passing through.

These more or less granular chips are still wet with the coolant used in machining all steel parts. This oil is removed by centrifuging the chips in the extractor and is delivered to sterilizer tanks, leaving the chips substantially dry. In dry form, they can be blown either into a storage hopper or directly into freight cars spotted on the adjacent siding. A blower supplying the air for moving the chips is an important part of this Turbine Equipment Co. system.

The cast iron chips are granular or powdered and not stringy like the steel chips. They do not require crushing and so can be delivered to a hopper and then to an extractor where any oil and nearly all of the water are removed. Then the cast iron chips, containing less than one pct of moisture are ready to be blown directly to a freight car on the adjacent siding. As chemical borings these chips command a premium price.

Cleaned and crushed steel chips blown to freight cars also command a higher price than turnings which are more bulky and take much more shipping space per pound. Since the steel chips are loaded into freight cars by blowing, substantially an automatic operation, manual labor requirements are virtually nil. Delivery to cars is via pipes the output lengths of which are swiveled. The discharge point therefore is easily adjusted to distribute the chips with fair uniformity over the length and breadth of a car without moving the car until it is fully loaded.

Discharge of cast iron chips is the same as for steel but through different pipes. Since the capacity of the system greatly exceeds the chip supply, it has to be operated only for about 4 hr daily and requires only one attendant.

Cutting oil extracted from the steel chips flows from extractors to a sump from which the oil is pumped into sterilizer tanks, where it is heated to 180 deg F. After sterilizing, the oil goes through a centrifuge, which removes water and dirt, and then to a 3000-gal storage tank. From this tank the oil is drawn off and mixed with new oil to bring viscosity and sulphur content to required specifications before it is ready for reuse.

Total oil recovery amounts to about 80 pct of that used and is valued at about 30¢ per gal. The saving on oil alone is substantial when it is considered that about 350 gals are recovered daily. Total savings, including those realized by the higher prices and lower freight rates obtained for the steel and cast iron chips are expected to come to $75 thousand per year. At this rate the total chip handling and oil recovery system will be amortized out of savings in less than two years.

Besides these direct savings, the system has other advantages. These include reduced space (especially for storage since chips are moved out daily to reduce car demurage.

LAYOUT of chip processing equipment and piping to freight cars. Steel chips are crushed and cutting oil is extracted. Salvaged oil, is sterilized in tanks, top left, and reused.

Special Tooling Boosts General Purpose Machine Output

◆ Demand for high production from general purpose machine tools often leads to some ingenious setups . . . Properly contrived, they can meet output requirements without the sacrifice of part quality or the need for extra workers.

◆ Here is how Clark Equipment tooled some standard lathes and drill presses to make gear transmission components . . . Special lathe arbors, multispindle drilling heads and indexing tables all help to speed up production.

By R. UPHAM, Chief Tool Engineer,
Transmission Division,
Clark Equipment Company, Jackson, Michigan

◆ WITH CAREFUL PLANNING, special setups on general purpose machine tools can often yield a better combination of precision machining and high production rates. Typical examples of such setups are some developed for making gear transmission components at Clark Equipment Co.'s Jackson, Mich., plant.

Split-pin synchronizer assemblies for the firm's finished transmissions must be sturdy and precise-functioning. Major machined parts for these synchronizers are a forged steel hub-and-flange section; also two spider-like bronze rings. One ring is assembled to each side of the steel flange by means of supporting pins that are inserted in matching holes in the ring and the flange.

In the initial machining operations, conventional setups are used to bore and spline a hole in the forged hub section. The hole is then used for locating and also for driving the part in certain additional operations. This is not only convenient but insures true location of machined surfaces in reference to the splined hole, as is specified.

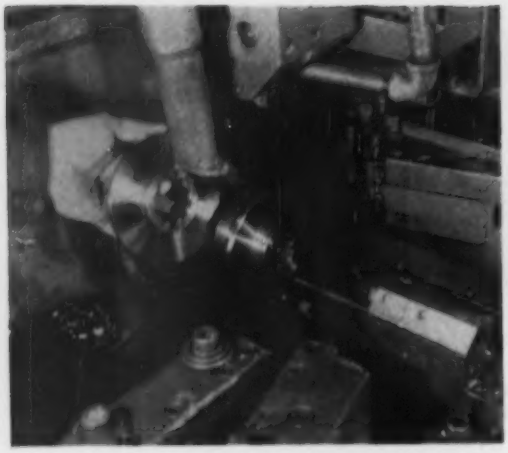
After the splined hole is produced, each forging goes to a Sundstrand lathe where the hub is set over a special splined arbor. The arbor air clamps the piece by a rocking or twisting action to hold it securely.

Tools on the rear slide of the lathe then straddle and rough face both sides of the flange and also face the hub. Next, front slide tools rough turn the outer diameter of the flange and the hub and also machine a step at the end of the hub. Finally, tools on a vertical slide chamfer both edges of the flange.

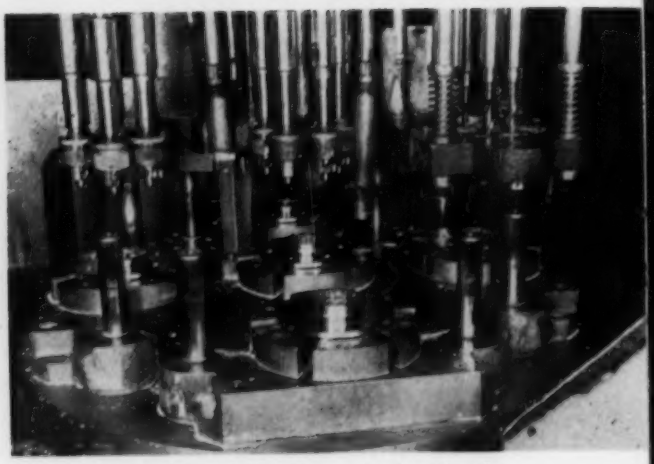
Special setup chamfers splines

Hub-and-flange forgings are then transferred to a Sheffield machine where the ends of the hub-hole splines are chamfered by a special cutter, the work being indexed between successive cuts. A light, air-operated plunger added to this machine acts to slow the infeed, thereby improving finish and increasing cutter life.

After the spline chamfering operation, workpieces then go to a second Sundstrand lathe.



SPECIAL splined arbor holds the flanged hub forging securely for initial rough turning.



FOUR rear stations drill, ream and chamfer the flange holes; front one is to load and unload.

There they are placed on the same type of arbor as on the first machine but with the remaining unmachined face outward. Again the rear slide tools finish-face both sides of the flange in a straddling cut and also face the outer hub end. Front slide tools then finish the flange's outside diameter, holding it within 0.002 in., and also rough and finish turn the hub diameter. Tools on the vertical slide complete the job on this machine by turning hub grooves at each side of the flange and chamfering both ends of the hub.

Next, the same Sheffield machine used previously again does spline-end chamfering as before, but on the opposite end of the hub hole. Layout of the equipment is such that one man operates both lathes and the spline-chamfering machine as well.

Holes drilled speedily

The next operation requires the drilling of six equally spaced holes in the flange, three for "blocker" pins and three for split spring pins. This is done in a Natco machine equipped with a five-station indexing table. Four stations are spaced around the table's outside edge and the fifth is located in the center. The station at the front edge of the table is used only for loading and unloading. The remaining four stations do all the machining and are equipped with six spindles each.

At the first table-edge work station, six holes are drilled through the flange. At the next edge station these holes are reamed. Tools at the third work station chamfer the upper edges of the six holes and maintain a depth tolerance of 0.005 in.

Finally, after it is unloaded at the front of the table, each work piece is turned over and placed in the center work station where the flange holes are chamfered on the opposite side. This last chamfering completes the work done on this machine.

A feature of the Natco setup is that the chamfering tools are spring loaded and held so that they can cut only to a specified depth. At this depth, collars bear against the top and bottom of the flange face to prevent the tools from feeding to a greater depth. This is important to the end product because the chamfered areas act as cam faces whose angle and position are factors in the proper functioning of the synchronizers.

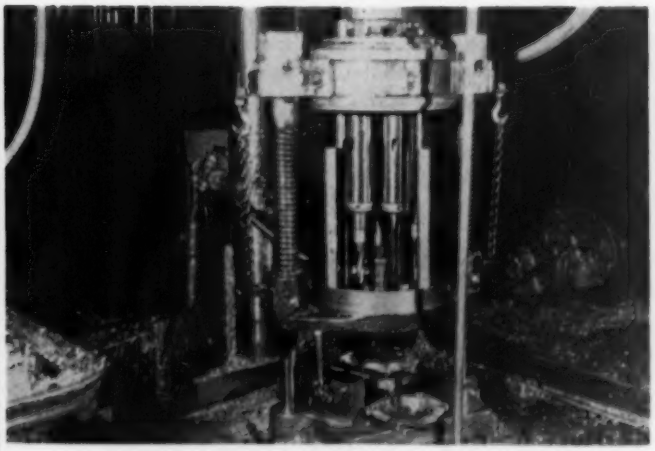
As for the spider-like outer rings for the synchronizer assembly, some are bronze castings and some are bronze forgings. They can be used interchangeably. The first operation on these rings is performed in a disk surface grinder. The ring is held in a fixture that permits both the work-piece and the fixture to rotate slowly as the latter is advanced around a track. Fixture advance is guided by a pivoted, arc-shaped bar that fits the track. This grinding operation qualifies the bronze ring for transfer to another Sundstrand lathe.

For the lathe-machining job, the piece is held in a drawback chuck. Then, through the use of a sine bar attachment, the central hole is taper bored and threaded. Thread specifications are 20 per in. at a 7½ angle. The front side of the ring is faced in this same operation by a cross-slide tool.

For precision drilling and spot facing the bronze rings, a 20 in. Walker-Turner drill press is fitted with an Ettco multiple-spindle drilling head. Because the machine operates very near its maximum capacity, a tension stay rod was put in between the bed and drive housing. This counteracts the tendency of so light a press to spring. Of the six holes drilled in this setup, three are spot faced 0.140 in. deep.

BRONZE rings are surface ground in a fixture that rotates while it advances along a track.

LATHE setup that faces the bronze ring, then taper bores and threads the inner diameter.



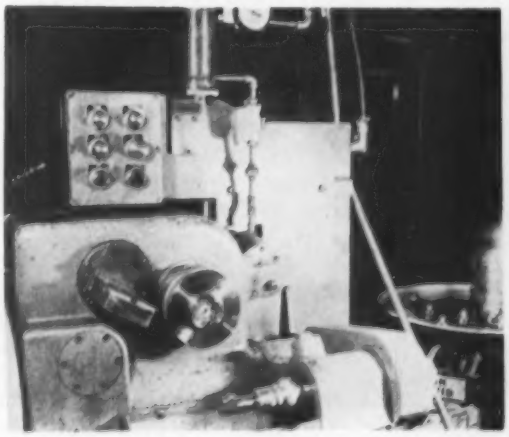
MULTIPLE-spindle head drills and spot faces holes in ring rim to precision limits.

TWO drill presses, one above the table and one below, chamfer both ends of holes at same time.

The final ring-machining operation is done in a second Walker-Turner drill press where the drilled holes are chamfered to precise limits from both sides at the same time. This, of course, requires that the machine have two drilling heads, one above and one below the table.

Physical arrangement of these ring-drilling operations also are such that one operator can tend both drill press setups.

Although some of the machines that work on these synchronizer parts have special purpose setups, the machines themselves are not special purpose types and can be used for other operations if necessary. Production demands for the synchronizers are so high, however, that the tooling arrangements described here are used almost continuously.



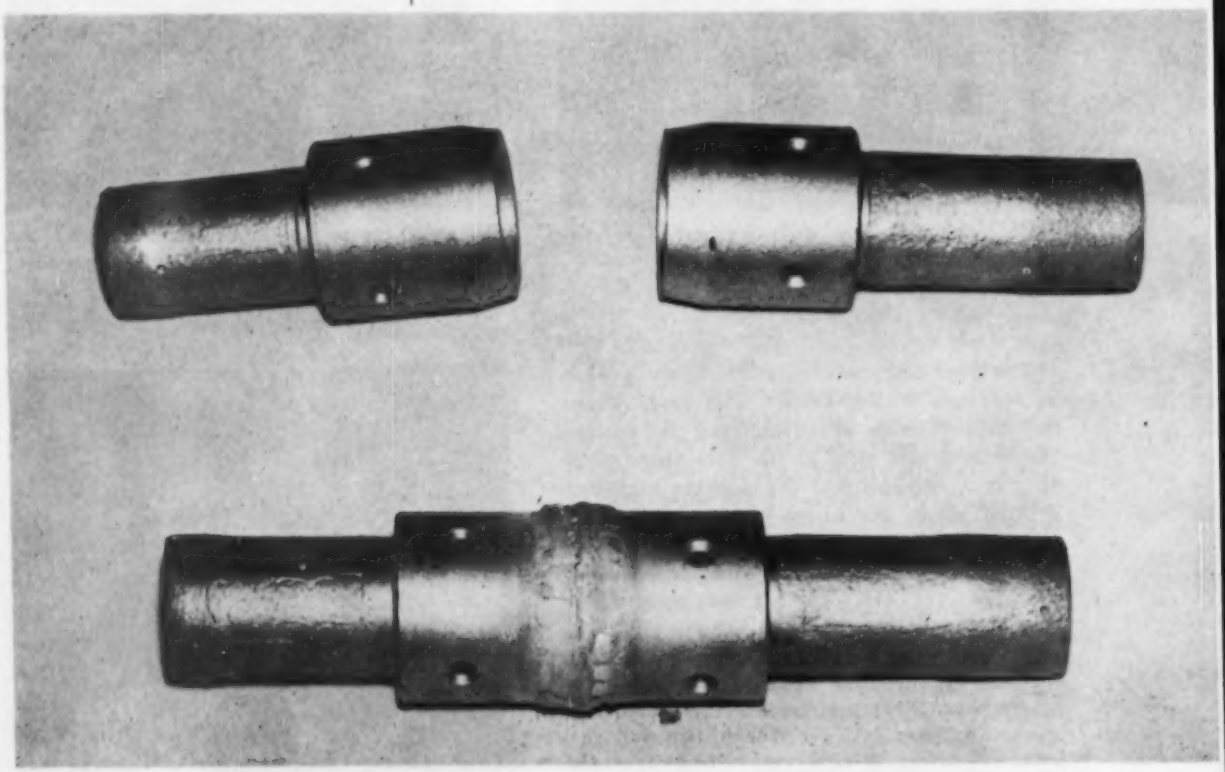
ENDS of hub splines are chamfered in this setup. Workpiece is indexed between cuts.

Cuts cycle time—

Induction Machine Pressure Welds Shafts Without Flash

By D. L. HANSEN,
Mechanical Engineer,
Tractor Works,
International Harvester Co.,
Chicago

◆ Pressure welding cupped end forgings for track roller shafts with an internal recess, formerly left internal flash at the joint . . . Now a special induction welding machine eliminates the flash problem and increases output.



CUPPED FORGINGS for track roller shaft before and after induction pressure welding show how recess for lubricant is formed.

◆ TRACK ROLLER SHAFTS produced for crawler tractors at the Tractor Works of International Harvester Co., Chicago, require a sizable internal recess to hold lubricant. To achieve this, two similar forgings with cupped ends are formed from 1026 steel, then induction pressure welded together, end-to-end.

A special Tocco induction welding machine of 50 kva capacity, operating at 3000 cps, was built to heat the cupped ends to 2200°F and then force the shaft sections together under high pressure. The induction coil consists of flat, hollow, water-cooled copper sections and includes a cylindrical opening which surrounds the forgings when they are locked in place. Heavy holding jaws, which are locked hydraulically, grip the shaft sections firmly during rolling.

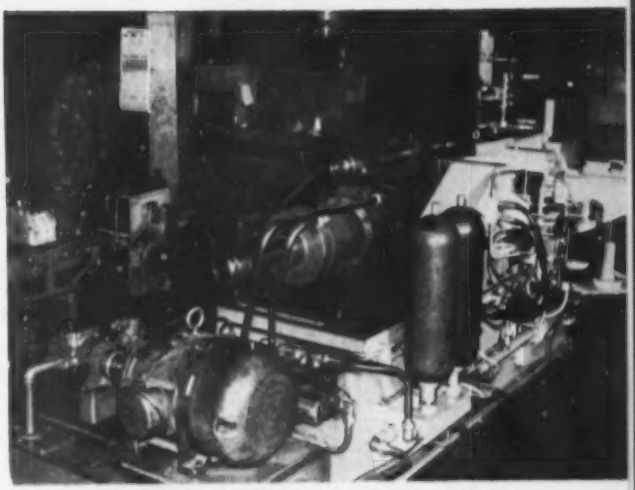
Previously, welds were made in a machine which forced the forgings together under heavy hydraulic pressure after oxyacetylene flames from a hand-oscillated ring burner raised the ends to welding temperature. The new method not only speeds up the operation. but eliminates internal flash at the joint.

The track roller forgings are about 2½ in. in diameter and have a taper at the cupped ends. They are loaded in about 15 seconds and an additional minute is required to heat them to welding temperature. While heating takes place, hydraulic pressure is applied to a sliding head which moves inwardly as the metal approaches the welding temperature. This pressure upsets the steel, increasing its diameter at the joint and resulting in a shaft about ⅜-in. shorter than the combined length of the two original forgings.

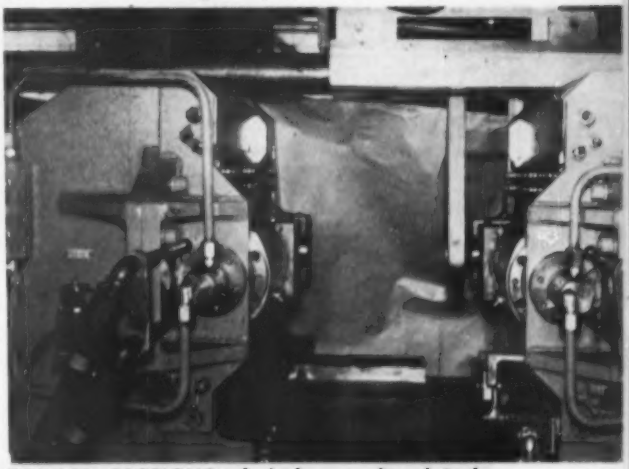
Welding time reduced

The upset metal is subsequently removed by machining, leaving the shaft cylindrical with an internal recess free of flash. After turning to size, the weld is normalized for one minute at 1600° to 1700°F in a separate induction coil connected to the same generator used in making the weld. Total welding time with the new machine is about 1¼ minutes on this shaft. About 1¾ minutes are required for a larger shaft, also processed in this machine. By the former method, cycle time ranged from 1½ to 3¼ minutes.

In addition to speeding production, the shafts have consistently uniform quality and are flash-free internally. The welds produced by induction pressure welding withstand extremely severe service conditions.



REAR VIEW of the induction welding machine shows the pressure equipment which applies the great force necessary to upset the metal.



FORGED SECTIONS of shaft are placed in hydraulically-operated jaws which grip them firmly and apply heavy pressure to effect an upset.

OPERATOR holds a welded shaft which has just been checked for leaks under pressure with the setup in the background. Welds are flash-free.

Don't wait for cooling—

Tractors Speed Openhearth Rebuilding

◆ DOWNTIME for rebuilding openhearth furnaces has been halved with a team of crawler tractors and a rubber-tired front end loader.

Instead of waiting 12 to 15 hr for a furnace to cool, Granite City Steel Co., Granite City, Ill., uses the equipment to start tearing down within an hour after shutdown.

Using a specially-built 20-ft rake as a battering ram, an Allis-Chalmers diesel crawler tractor reaches into the furnace to knock down the roof in about 20 minutes. Though very hot, the brick is raked out through the doors onto the floor, where a second crawler tractor with a two-yard front-end shovel loads it onto railroad cars for disposal.

In the slagpits and checker chambers beneath the furnaces, the crawler tractor, fitted with a 1¼ yard front-end shovel, knocks down the brick walls and loads out accumulated slag and old brick. The tractors can reach in to pull out the material and hasten furnace cooling even though air temperature is still about 200°F and bricks are red hot.

Teardown of a furnace is completed in three to four hours. In rebricking, new firebrick is picked up from stockpiles or railroad cars inside the mill and carried to the furnace area by the rubber-tired loader, which is also used to lift and place platforms for the bricklayers.

The special rake attachment for teardown work, designed by Granite City Steel, consists of a piece of steel plate notched on the working side and attached to a 20-ft beam. The assembly mounts on the front-end shovel lifting mechanism of the tractor when the bucket is removed. It can be quickly switched with the bucket, increasing the versatility of the tractor.

Above: **RAKE knocks down, drags out hot roof brick for shovel removal to waiting freight cars.**

Left: **LOADER brings new firebrick from stockpiles or railroad cars to bricklayers' scaffold.**

Point of Honor

From the collection of Lewis Winant, New Jersey Arms Collectors Club. Maker: Johann Kuchenreuter, Regensburg, Germany, 1740-1757. An 11-by-14 inch print of this illustration with bearings and lettering omitted is available on request on company letterhead.

In today's business dealings (as in yesterday's "affairs of honor") both parties are protected by an intangible factor known as INTEGRITY—a figurative handsake between producer and consumer. Today, this point of honor assures you that the product you buy is exactly as represented. When you write COMPO Oil-Retaining Porous Bronze Bearings into your specifications you find that it is a point of honor with Bound Brook, as a reliable manufacturer, to provide you with the best powder metallurgy bearings that can be produced.

BOUND BROOK

BOUND BROOK OIL-LESS BEARING CO. EST. 1883. BOUND BROOK, N. J.

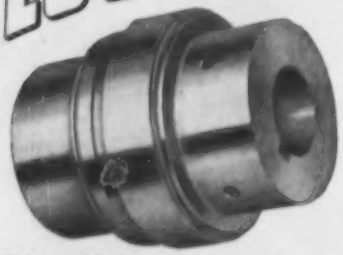
Pioneer in

POWDER METALLURGY BEARINGS & PARTS

"After 15 Years the Cushions Were Worn"

...actual report on

LOVEJOY



Flexible Couplings

Up to fifteen years maintenance-free service is not unusual with Lovejoy lubrication-free flexible couplings.

Performance like this is practical proof of these soundly engineered features:

SIMPLE, RUGGED CONSTRUCTION
Fewer parts. No intricate mechanisms. Nothing to lubricate.

LOAD TRANSMITTED BY CUSHION COMPRESSION
No wear on the metal jaws.

DOUBLE-LIFE CUSHIONS
One half of the cushions act as idlers—except on reversible loads. A quick interchange provides a new set of cushions. This can be done without dismantling the coupling.

Illustration at right shows a Lovejoy Type CF flange-mounted coupling. Rated at 160 hp., 800 rpm., this space saver connects drive shaft between diesel power unit and generator.

You can get Lovejoy performance for your application.

Let us know your requirements or request complete-line catalog.

LOVEJOY FLEXIBLE COUPLING CO.

4866 W. LAKE STREET • CHICAGO 44, ILLINOIS

Mfrs. of Flexible Couplings, Variable Speed Pulleys and Transmissions, Motor Bases and Universal Joints.

FREE AIDS

New Technical Literature:

Catalogues and Bulletins

Auto-Tran

A transfer-type, basic machine chassis in a wide range of standard models has been added to round out a complete series of standard indexing units offered by the company. Known as the Auto-Tran unit, it provides a standard unit for application to both automatic and semi-automatic assembly operations. *Swanson Tool & Machine Products.*

For free copy circle No. 1 on postcard, p. 153.

MST 6Al-4V

MST 6A1-4V, a highly stable titanium alloy for use at elevated temperatures, is described in a bulletin. It includes the metallurgy, chemistry, physical properties, mechanical properties, elevated temperature strength, and other valuable information on this new alloy. The bulletin includes graphs and tables. *Mallory-Sharon Titanium Corp.*

For free copy circle No. 2 on postcard, p. 153.

Stampings

A new bulletin on the finishing of stamped metal parts by means of the airless abrasive blasting process is available. This bulletin contains 4 case histories of companies, giving performance data and showing photographs of the equipment they use for this work. *Wheelabrator Corp.*

For free copy circle No. 3 on postcard, p. 153.

Arcast molybdenum

A compilation of all available technical and fabricating data on arcast molybdenum is presented in a 72-page booklet. It is designed to provide those interested in the high temperature application of molybdenum with a complete picture of where it stands today and possible uses in the very near future. *Climax Molybdenum Co.*

For free copy circle No. 4 on postcard, p. 153.

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 153.

Sheets and Strip

"Buyer's Guide to Sheets and Strip," a new 8-page bulletin, lists more than 20 different kinds of flat rolled steel furnished in coils, stock sizes, and cut-to-order blanks. *Joseph T. Ryerson & Son, Inc.*

For free copy circle No. 5 on postcard, p. 153.

Package drives

Features of package drives for speed control of machine tools and other applications requiring accurately variable speed over a wide range are described in a new bulletin just released. *Allis-Chalmers Manufacturing Co.*

For free copy circle No. 6 on postcard, p. 153.

Shaped tubing

Shaped tubing is illustrated and described in a data memorandum. Shapes of mechanical tubing for bushings, punches and machine parts are illustrated. It includes size range, commercial tolerances, lengths, temper, and how to order. *Superior Tube Co.*

For free copy circle No. 7 on postcard, p. 153.

Toolholders

New additions to the company's line of toolholders, which include single and double end mill adapters, tang drive tapered socket adapters, drawbar type tapered socket adapters, and shell end mill arbors, are described in a new catalog. *Universal Engineering Co.*

For free copy circle No. 8 on postcard, p. 153.

FREE TECHNICAL LITERATURE

Oxygen analyzer

A technical bulletin on the application of model 2B2B dissolved oxygen analyzer to modern steam generating plant operations is available. Data covered includes basic principles of measurement, equipment required, flow diagrams and descriptions of typical sampling systems for various types of plant set-ups, etc. *Arnold O. Beckman, Inc.*

For free copy circle No. 9 on postcard, p. 153.

Die handling trucks

A new 4-page folder detailing the company's line of hydraulic die handling trucks with capacities from 10,000 to 80,000 lb is available. The trucks feature hydraulic push-off for accurate die positioning; packaged unit assemblies for fast, easy maintenance, etc. *The Elwell-Parker Electric Co.*

For free copy circle No. 10 on postcard, p. 153.

Accessory data

A folder discusses the over 60 standard and specially-engineered Towmotor accessories to choose from in reducing your handling costs. These include: die unloader; tow-loader; crane arm; revolving roll clamp; carton clamp, etc. *Towmotor Corp.*

For free copy circle No. 11 on postcard, p. 153.

Electric power

Compact and versatile, the new line of small size, high capacity Caterpillar Diesel Electric Sets brings a new concept in generators. These major developments are described in "Modern Electric Power." The booklet describes the advantages of these rugged sets. *Caterpillar Tractor Co.*

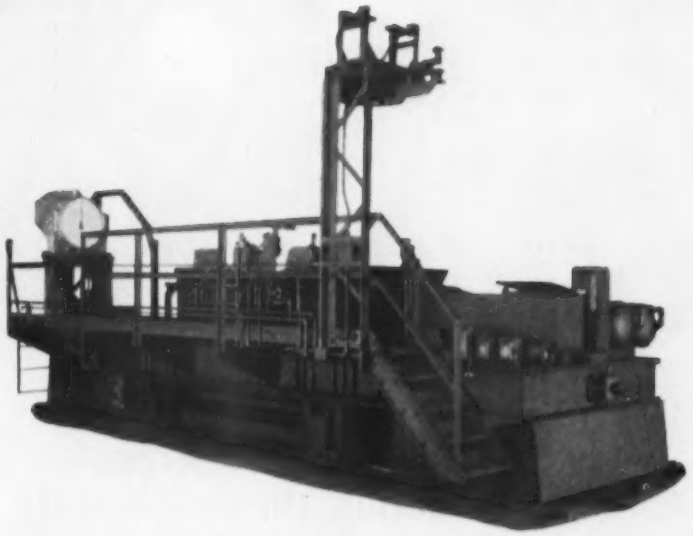
For free copy circle No. 12 on postcard, p. 153.

Abrasive belt unit

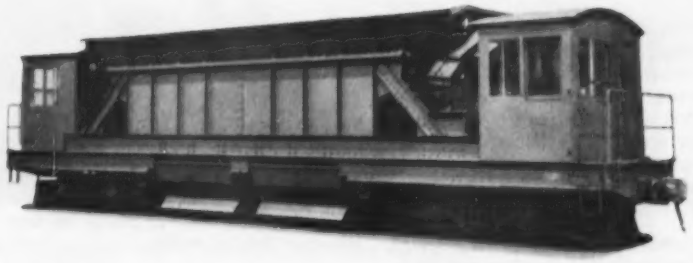
A bulletin covers the G & P 6072 abrasive belt unit and available accessories. Adaptability of the unit is the theme of this brochure, and a series of illustrations showing various mountings and applications clearly show these features. *Grinding & Polishing Machinery Corp.*

For free copy circle No. 13 on postcard, p. 153.

HERE'S *built-in* STAMINA *that spells* DEPENDABILITY

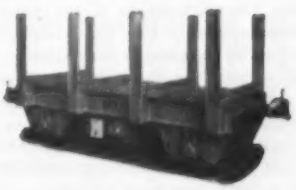


10-TON SCALE CAR, SINGLE HOPPER, BOTTOM DUMP



75-TON ORE TRANSFER, GABLE BOTTOM, SIDE DUMP

Atlas "single-lever" Safety-Type transfers give outstanding short-haul service . . . such as between buildings, for cross-bay crane service, and movement in production. Powered to meet your operating needs . . . storage battery, diesel or gas-electric, or cable reel.



Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

QUALITY CONTROL FOR MASS PRODUCTION. Days have been chopped to minutes by the installation of such equipment as this direct-reading spectrometer which can analyze beryllium copper alloys while they are still molten.

NEW MANUFACTURING FACILITIES INCREASE PRODUCTION, IMPROVE QUALITY OF "BERYLCO" BERYLLIUM COPPER

The production of beryllium copper, that uniquely versatile alloy which does so many jobs so well, has always been a complicated process. Beryl ore must be processed chemically to produce beryllium oxide. Master alloy is obtained by subjecting beryllium oxide, copper powder, and carbon to high temperatures in electric arc furnaces. Subsequent operations include ingot casting, soaking, annealing, pickling, hot and cold rolling, and drawing.

New technological advances—represented by a multimillion-dollar new investment in plant and equipment by The Beryllium Corporation—have successfully adapted basic quality control to large-scale production. Users of "Berylco" will reap the benefits. The spectrometer shown above, for instance, enables very close chemical control to be exercised in the production of the various beryllium copper alloys. New rolling mills produce strip to closer tolerances while enhancing over-all quality. These and other new tools produce sizes and forms not previously available —and in many cases have achieved economies which have already been passed on to users.

Write for engineering help or sample testing material.

ORE GRINDING MILL—a part of the fully integrated "Berylco" facilities.

NEW COLD-ROLLING STRIP MILL finishes beryllium copper to close tolerances.

BERYLCO®

THE BERYLLIUM CORPORATION

DEPT. 5J, READING 6, PA.

STOCKED BY WAREHOUSE DISTRIBUTORS THE COUNTRY OVER

Resistance welding

"Resistance Welding At Work," a bulletin covering the case history of resistance welding the U. S. Air Force Northrop F-89D, is available. It is proof of Northrop's firm belief in the vast potential of resistance welding as a better, more economical, and most practical method of fabrication. *Sciaky Bros., Inc.*

For free copy circle No. 14 on postcard, p. 153.

Hot formed nuts

A new type of semi-finished hot formed nut is now being produced. According to the manufacturer, these new hot formed nuts surpass in appearance either cold made or hot pressed nuts. They are described in a bulletin. *Pittsburgh Screw & Bolt Corp.*

For free copy circle No. 15 on postcard, p. 153.

Tempering furnaces

A 4-page bulletin which describes the complete line of tempering furnaces is available. Cross-section diagrams, specifications and performance data on toolroom box type furnaces for tempering, preheating tools and dies, etc., are listed. *Lindberg Engineering Co.*

For free copy circle No. 16 on postcard, p. 153.

Sintering furnaces

The topic of a new booklet is "Furnaces for Sintering Powder Metal Products." These furnaces are also for the reduction of metallic oxides. They were specially designed and engineered to meet the many complex problems that occur in these processes. *Drever Co.*

For free copy circle No. 17 on postcard, p. 153.

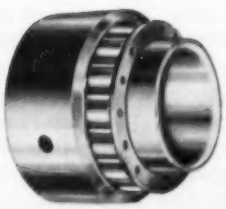
Precision bearings

Over 500 different standard radial ball bearings are described and tabulated by bore size (ranging from .0250 in. to .2500 in.) in a comprehensive new 24-page catalog just published. The publication describes 16 types of radial bearings in detail, including 2 new series of bearings, and presents summary information on six other standard series of ball bearings. The catalog also contains many design aid features. *Miniature Precision Bearings, Inc.*

For free copy circle No. 18 on postcard, p. 153.

86% OF ALL INGOT CARS ROLL ON RUGGED HYATTS

at the Indiana Harbor Works of Youngstown Sheet and Tube



In this great mill, *as throughout the steel industry*, HYATTS are far and away the *preferred* roller bearings for ingot cars.

Why this overwhelming preference? There are six sound reasons:

1. **HYATTS greatly reduce friction and starting power requirements**
2. **HYATTS permit longer trains, faster and smoother car spotting**
3. **HYATTS perform dependably despite constant heating and cooling, abrasive dirt, and pile-driver shocks when ingots are pounded free from the molds by the stripper**
4. **HYATTS' straight cylindrical design permits lateral expansion without cramping rollers**
5. **HYATTS provide ample reserve for overloads**
6. **HYATTS virtually eliminate costly downtime**

If you want bearings that can *keep on taking* the most brutal kind of punishment—*can keep your production rolling profitably*—standardize on HYATTS throughout your mill!

HYATT ROLLER BEARINGS

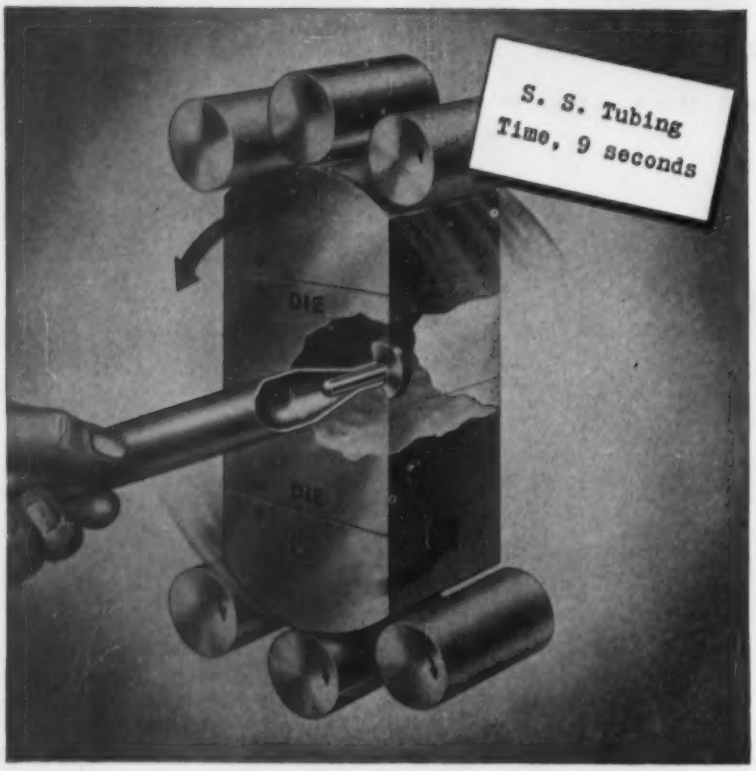
STRAIGHT ◯ BARREL ◯ TAPER ◯

HYATT BEARINGS DIVISION • GENERAL MOTORS CORPORATION • HARRISON, NEW JERSEY

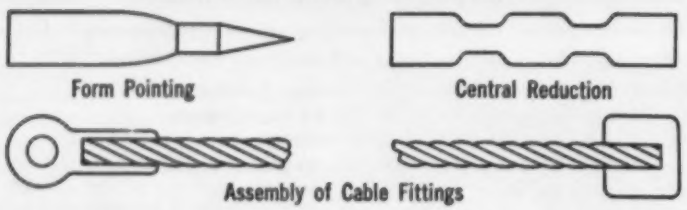
GET MORE PARTS

Instead of chips and scrap

with ROTARY SWAGING



OTHER SWAGING EXAMPLES:



Check with Fenn for engineering advice on swaging your product.

FENN

PRECISION ROLLING MILLS—TURKS HEADS—WIRE SHAPING MILLS—SWAGING MACHINES—ACCESSORIES

The Fenn Manufacturing Company, 315 Fenn Road, Newington, Connecticut

FREE TECHNICAL LITERATURE

Industrial waste treatment

A new process data sheet outlines latest developments for control of ph and redox in industrial waste treatment processes. With it is provided a ph controllability analysis questionnaire which may be completed and returned for recommendations of control methods and equipment. *Leeds & Northrup Co.*

For free copy circle No. 19 on postcard, p. 153.

Radioisotope reagents

In a special catalog describing the new radioisotope reagents, the company lists the chemicals and specific activities which are available, and gives details on obtaining necessary A.E.C. authorization for purchase of radiochemicals. *Allied Chemical & Dye Corp.*

For free copy circle No. 20 on postcard, p. 153.

Automatic parts handling

A complete line of automatic parts handling equipment for the pressroom is the subject of a new folder. It includes information on the additional units for the Hamilton automatic press line and the complete line of automatic accessories. *Hamilton Automation, Inc.*

For free copy circle No. 21 on postcard, p. 153.

Roto-Clone

Type D Roto-Clone combines design and mass production economies to make it the lowest priced dust collector in its class. A bulletin describes its basic design features: small space requirement; maintained performance over a wide range of operating conditions; constant exhaust volume; high collection efficiency. *American Air Filter Co., Inc.*

For free copy circle No. 22 on postcard, p. 153.

Lighting equipment

Exide Lightguards, battery-powered emergency lighting equipment, are described in a new 8-page catalog. The catalog contains diagrams, charts and specifications useful to architects, builders, contractors, executives, engineers, purchasing agents and others in planning emergency lighting installations. *The Electric Storage Battery Co.*

For free copy circle No. 23 on postcard, p. 153.

FREE TECHNICAL LITERATURE

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

This section starts on p. 148

Lathes

A folder just published describes engine lathes, hollow spindle lathes and gap bed lathes. It includes features and specifications of the lathes such as: capacity; dimensions; threading and feed capacity; drive; tailstock; headstock; carriage; taper attachment; steady rest; follow rest; weight. *Axelson Manufacturing Co.*

For free copy circle No. 24 on postcard.

Hi-Cyclic

A book which contains all the bulletins the company is making available has been published. It includes information on drilling and tapping machines, Hi-Cyclic air and hydraulic valves, and air powered automatic drill press feeds. *Beckett-Harcum Co., Inc.*

For free copy circle No. 25 on postcard.

Sheet metal fabricator

Rapid interchangeability for punching, notching, and nibbling is one of the outstanding features of the Wales Sheet Metal Fabricator described in an 8-page catalog. No templets are required. *Wales-Strippit Corp.*

For free copy circle No. 26 on postcard.

Plunger pumps

A new bulletin covers information on plunger pumps with capacities up to 225 GPM and pressures up to 11,700 psi. Major features are informatively explained along with individual illustrations of component parts. *Worthington Corp.*

For free copy circle No. 27 on postcard.

Precision measuring tools

A beautifully illustrated, hard-covered book, which is dedicated to those who require precision measurements, is available. The principal products it describes are: plug gages; thread measuring wires; gear measuring wires; gage blocks; optical flats; monochromatic lights; light wave micrometers; precision lapping; special parts. A price list supplement is also included. *The Van Keuren Co.*

For free copy circle No. 28 on postcard.

Plating power

A Guide to Better Plating Power, which covers the company's complete line of selenium rectifiers, is available. Illustrated and described are basic and custom designed units with D.C. output ratings ranging from .5 to 50,000 amperes, available in either air-cooled or completely sealed water or oil-cooled models, with all types of automatic controls. *Bart-Messing Corp.*

For free copy circle No. 29 on postcard.

Utility folder

A new 3-part utility folder designed for the metal finishing and plating department is available. It can be used for 3 purposes: a stock record to help plants check their finishing supplies inventory; an emergency First Aid wall chart outlining treatment for plating room accidents; or a file folder to file bulletins supplied by supplier sales engineers. *Frederic B. Stevens, Inc.*

For free copy circle No. 30 on postcard.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 9/15/55

Circle numbers for Free Technical Literature or Information on New Equipment:

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31	32	33	34	35	36	37	38	39	40
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FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

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NEW YORK 14, N. Y.

BUSINESS REPLY CARD
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New York, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **9/15/55**

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Desurger

The Desurger for use wherever liquids flow is described in a bulletin. It contains information on how it works; eliminates maintenance costs; increases flow capacity of lines; protects instruments, valves, fittings, pipe; saves space; prevents pulsations and pressure surges; controls every gallon of liquid handled, etc. *Westinghouse Air Brake Co.*

For free copy circle No. 31 on postcard.

Tubing and pipe

Information of interest and value to engineers and designers associated with the use of stainless tubing and pipe is included in a data folder just published. The bulletin touches on the attributes of stainless steel and how it can be fabricated. *The Babcock & Wilcox Co.*

For free copy circle No. 32 on postcard.

Sales tool references

Two new bound catalogs have recently been issued. The 1955 Quick Guide and the 1955-1956 General Catalog contain list prices and brief descriptive information on the products of the Trumbull Components and Distribution Assemblies Departments. *General Electric Co.*

For free copy circle No. 33 on postcard.

Vacuum pumps

A new 52-page catalog of the company's complete line of high vacuum pumps, featuring an engineering section containing formulas and data of practical value to all vacuum engineers, is available. *New York Air Brake Co.*

For free copy circle No. 34 on postcard.

Bonded mica insulation

A new bulletin just published describes Micabond, bonded mica insulation, as to its process and its uses. The bulletin contains illustrations and informative data on Micabond. *Continental - Diamond Fibre Div., The Budd Co., Inc.*

For free copy circle No. 35 on postcard.

FOR MORE LITERATURE
Many companies offer free literature and other information in their advertisements. For the names of these firms see the company listings in the index of advertisers.

Tooling plastics

A group of cards, die cut to resemble the white drums in which the company ships tooling plastics, is available. Each individual card gives all the necessary information relative to the hardener necessary and other pertinent information concerning the resin involved. *Furane Plastics, Inc.*

For free copy circle No. 36 on postcard.

Almetal joints

A new brochure discusses the advantages of the company's line of exclusively designed needle bearing Universal joints and shows design principles. Efficient and compact, these joints are employed in all power transmission applications from the smallest to the largest. *Detroit Bevel Gear Co.*

For free copy circle No. 37 on postcard.

Dimetcote

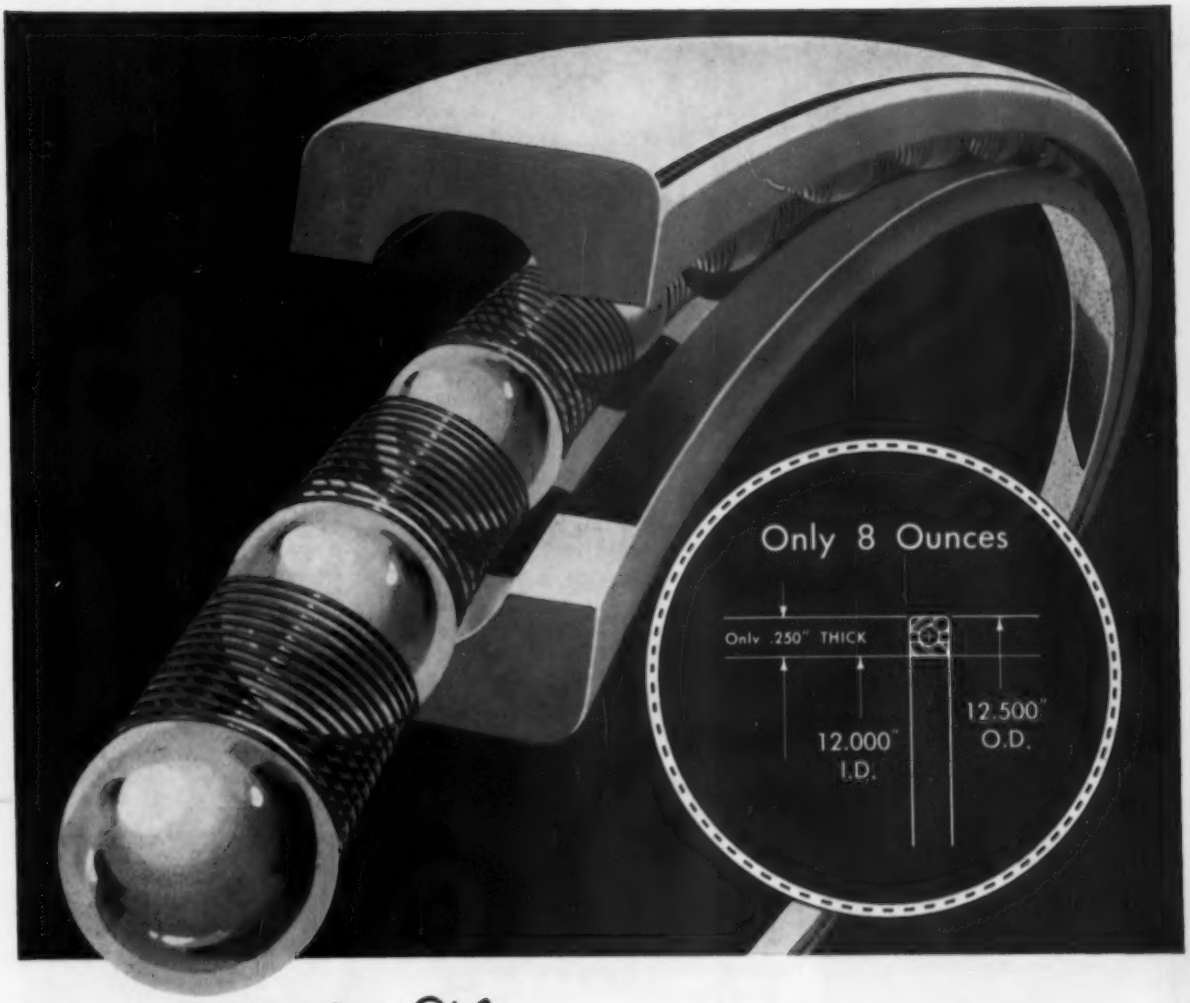
Plant maintenance painters can now give existing steel structures the same protection that galvanizing affords, plus salt water resistance, with an unusual protective coating called Dimetcote. Not a paint, Dimetcote is a 100 pct inorganic, metallic zinc coating that contains no oils or resins. *Amercoat Corp.*

For free copy circle No. 38 on postcard.

Magnetic-particle testing

"Questions and answers on magnetic-particle testing" is a new booklet which is available. It discusses prod and coil techniques, current and voltage conditions, effects of scale, and portable field work. *North American Philips Co., Inc.*

For free copy circle No. 39 on postcard.



Reali-Slim... by Kaydon
world's thinnest radial ball bearing

HERE'S a typical example of Kaydon's *Reali-Slim* unique radial ball bearing that's finding wide application in practically every industry. *Reali-Slim* are the world's finest thin-section bearings and proportionately are thinner than a wedding ring. The bearing illustrated here is 12.000" I.D., 12.500" O.D., .250" thick — weighs less than 8 ounces. Designed for minimum weight and space limitations, it has a static load capacity of 5,520 lbs. and 894 lbs. at 100 rpm.

If you're looking for *Reali-Slim*, lightweight, radial ball or roller bearings, look at Kaydon's *Reali-Slim* line. Besides hundreds of standard *Reali-Slim* designs, there's a wide variety of special races, seals and separators to meet special bearing problems. What's more Kaydon is able to produce these *Reali-Slim*, high-precision bearings because Kaydon specializes in the unusual. In addition, Kaydon bearing engineers are prepared to give you valuable help with technical bearing application problems.

For complete data on *Reali-Slim* bearings for standard or special applications, ask for engineering Catalog No. 54 RS.

***Reali-Slim* Ball Bearings** — in Conrad, angular contact, 4-point contact and other types are available in seven standard cross sections from .250" to 1" and in bore diameters from 4" to 40".

***Reali-Slim* Roller Bearings** — in radial or taper roller types are available in cross sections from 5/16" and in bore diameters from 5" to 40".

K-554

THE KAYDON ENGINEERING CORP.

MUSKEGON • MICHIGAN

All types of ball and roller bearings — 4" bore to 120" outside diameter . . .

Taper Roller • Roller Thrust • Roller Radial • Bi-Angular Roller • Spherical Roller • Ball Radial • Ball Thrust Bearings

DIEMAKING: Volume Methods

Making dies by mass production methods permits savings to 25 pct . . . Aids in better planning of production schedules.

Diemaking has been taken out of the custom class and placed on a mass production basis by a Lansing, Mich., firm, with savings up to 25 pct on quantity orders.

Custom Die Co., recognized the need some years ago when a customer ordered turbine blade forging dies. The customer's requirements of several hundred sets a month pushed the company's custom production facilities to the limit. So company engineers set about analyzing each step required in making die halves and developed fixtures and equipment to make production a volume job.

Cut From Bars

Die blanks were cut from forged bars rather than forged individually, then placed in fixtures for grinding to rough size. The blanks were placed in fixtures on profiling equipment, with duplicator attachments for Kellering. Tops and bottoms were placed in lots and run through separately by operators who performed one operation only in this intricate production schedule.

A benching machine was then developed incorporating a tracing head and a small belt grinder. The surface pattern master die is duplicated on the grinder. Then dies are ready for finish-benching, the step where mass production meets its maximum incongruity.

School Set Up

A school was set up to train operators to finish the surface of a specific portion of either the top or bottom die. This one production step alone resulted in valuable savings in time. The net result was mass production achieved at a price about one-tenth the cost of the original set of dies.

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 153. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Much of the credit for the mass production cost saving factor, the firm feels, is due to its ability to plan production schedules under the new setup and place planning under a full-time control department.

Dies mass-produced . . .

Machining:

New carbide gives 6:1 better performance.

Severe interrupted cutting of a cast alloy steel cam was recently made easier and more economical at Wysong and Miles Co., Greensboro, N. C., through use of a new general purpose steel-cutting carbide which outperformed other carbides six pieces to one.

The firm had been encountering difficulty in cutting the steel cam's eccentric large diameter and diagonal bolts on the periphery of a smaller diameter. Originally the operation was performed with long triangular prismatic

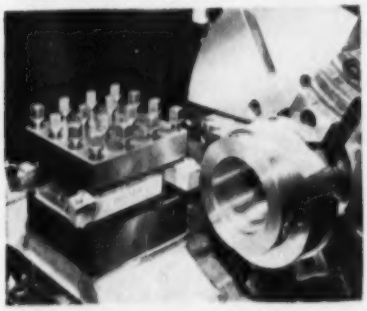
type inserts which were reground when worn to provide six cutting edges.

Throwaway Inserts

The job is now tooled with new Kennametal turnover type throwaway button inserts. Because of the thinness of the inserts, it is more economical to replace them —eliminating expensive regrinding of worn top and bottom edges. The turnover design provides six cutting edges on each triangular indexible insert.

Machining includes rough and finish turning of a 8-in. diameter with a 2½-in. eccentric section and a 6-in. diameter with a 2-in. collar containing two ½-in. diameter diagonal bolt holes. No problems were encountered in facing. However, carbides formerly used chipped badly in turning only one piece.

The 5½-in. long Rc 20 cam is machined on a 3A Warner & Swasey 40 hp turret lathe. Feed is 0.0167 in. per revolution and the surface fpm rate is 236 for roughing and 342 for finishing while depth of cut is 5/16-in. roughing and 1/16-in. finishing.



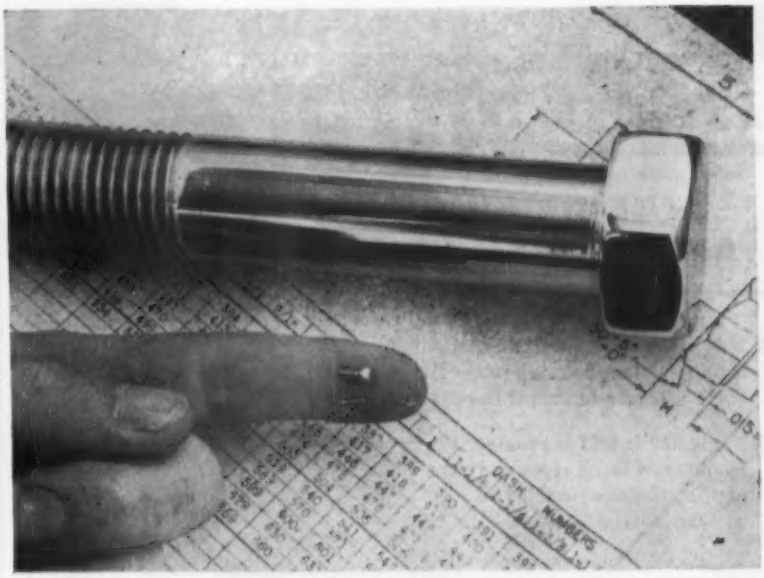
Throwaway inserts . . .

Welding:

Improved pipe process leaves no ID weld bead.

A new process developed to manufacture welded stainless steel and high alloy tubing and pipe eliminates the weld bead left on the inside diameter of tubing after welding.

Developed by Trent Tube Co., Crucible Steel Co. of America subsidiary, the process results in a pipe with improved physical



ALLMETAL'S HEX HEAD STOCK spread includes 2-56 x 3/16 cap screw (1/100 oz.), and 1¼-7 x 7½ bolt (a weighty 3 lbs., 1 oz.). Between these two extremes, 497 different hex head bolt sizes are carried in stock.

WORLD'S LARGEST STAINLESS FASTENER STOCK AT ALLMETAL

Leading manufacturers launched a switch to a fast growing firm (specialists in stainless steel) for their fastener supplies. They found that there's no stock like the largest, and Allmetal Screw Products Company has the largest stock of stainless fasteners in the world.

One significant reason manufacturers find Allmetal stainless fasteners so fascinating is their hex head bolt stock (see cut). And talent to follow through with fast delivery of screws, nuts, washers, rivets, pins, nails, and "AN" fasteners.

Chief cause for Allmetal's ability to turn out fasteners — and have them ready for immediate shipment — is their spanking new plant in suburban New York (Garden City, Long Island). These added facilities — plus 26 years of specialization in tough alloys — give Allmetal the combination to supply stainless fasteners when needed. Stock list brochure available.

MANUFACTURERS SINCE 1929

ALLMETAL

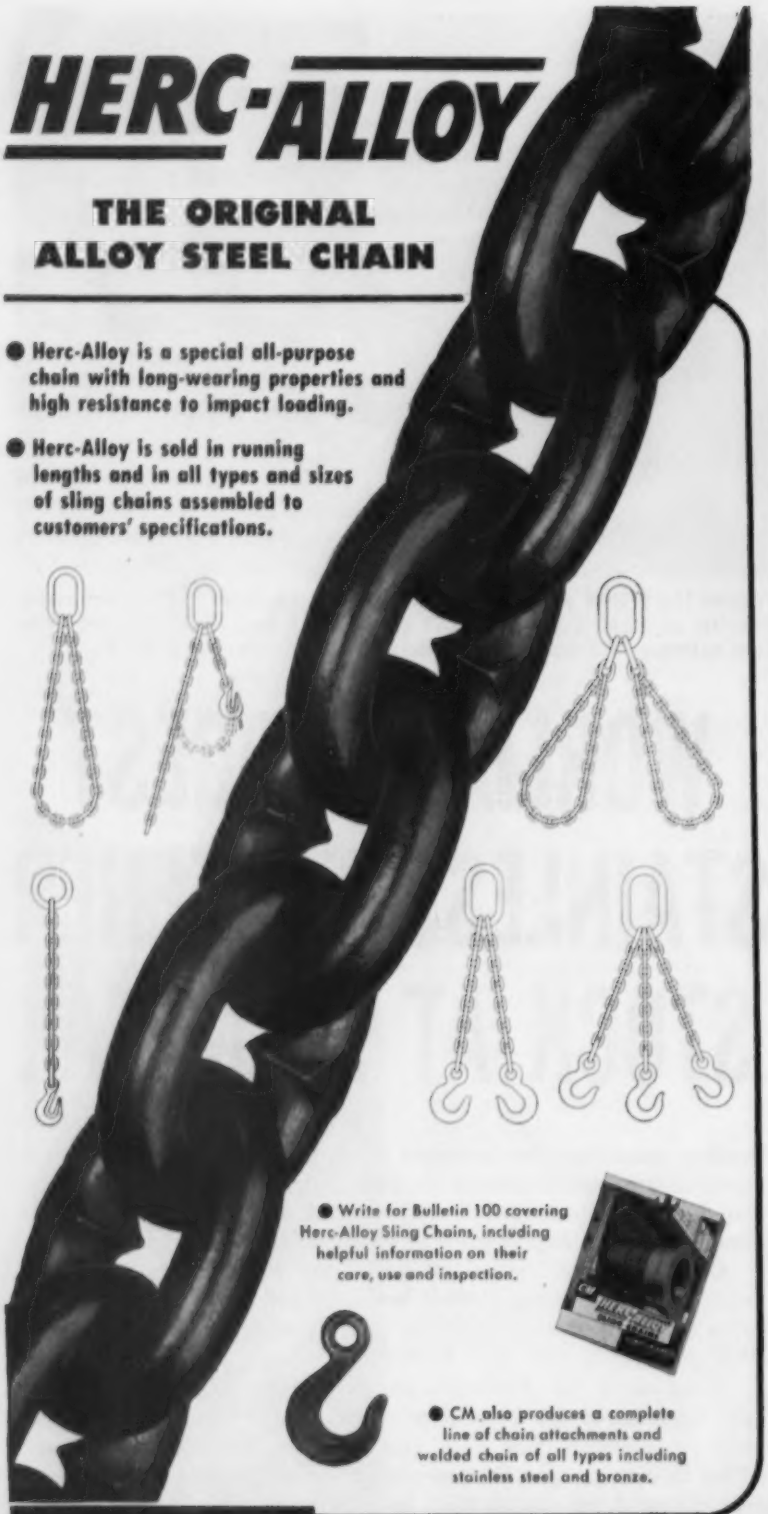
SCREW PRODUCTS COMPANY, INC.

GARDEN CITY NEW YORK

HERC-ALLOY

THE ORIGINAL ALLOY STEEL CHAIN

- Herc-Alloy is a special all-purpose chain with long-wearing properties and high resistance to impact loading.
- Herc-Alloy is sold in running lengths and in all types and sizes of sling chains assembled to customers' specifications.



- Write for Bulletin 100 covering Herc-Alloy Sling Chains, including helpful information on their care, use and inspection.

- CM also produces a complete line of chain attachments and welded chain of all types including stainless steel and bronze.

CM HOISTS AND CHAIN

COLUMBUS McKINNON CHAIN CORP.
Tonawanda, New York
Regional Offices: NEW YORK • CHICAGO • CLEVELAND
In Canada: McKINNON COLUMBUS CHAIN LTD., ST. CATHARINES, ONT.
Herc-Alloy®

properties, appearance and corrosion resistance. The Company feels the process will broaden the pipe's potential uses, since the

No ID weld bead . . .

weld bead on the inside diameter of tubing after welding has made it difficult to produce quality pipe after cold-working operations.

Rolls Inverted

Weld bead was eliminated on the inside diameter by inverting the rolls of the continuous forming mill and then welding the formed tubing, by the inert-gas shielded-arc process, from the underside. The resulting weld is a complete fusion of the butted edges of the strip. Gravity eliminates the ID bead from forming.

Casting:

New railroad wheel completes 5,200,000-mi. test.

A new cast steel heavy-duty wheel for freight cars has successfully completed an intensive 5,200,000 car-mile test on 14 American railroads.

Now in production at American Brake Shoe Co.'s Southern Wheel Div. plant in Calera, Ala., the new wheel will be less expensive than other steel car wheels because of modern foundry techniques and time-tested casting methods.

How It's Made

Metal for the cast steel wheel is melted in electric arc furnaces, poured in conventional sand molds, and then heat-treated twice

by a patented process. The result is a stress-relieved metallurgical structure showing extreme wear resistance and a high degree of toughness. With a 1.5 carbon content, the analysis of this steel is similar to high quality die steels which, like railroad wheels, must withstand a combination of heat, abrasion, and impact.

Automatic machining of all wearing surfaces assures precise dimensional control and rotundity and outstanding dynamic balance. Conventional practice is used for boring, tapping and mounting.

Bending:

Homemade mandrel saves money, setup time.

Tight radius bends in aircraft tubing are being formed with a ball-type mandrel that costs less, sets up more quickly and forms more efficiently.

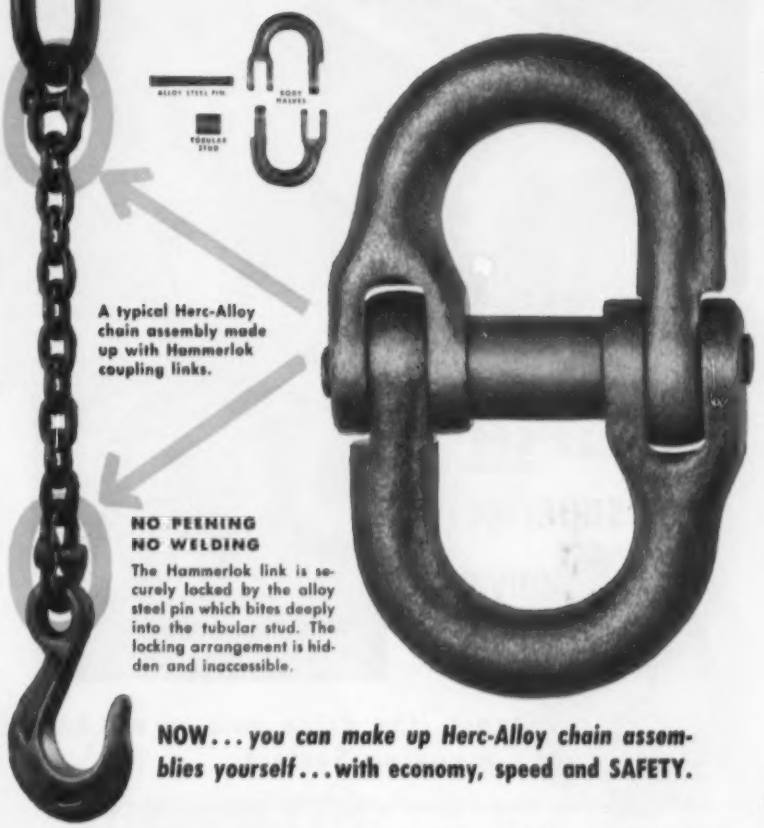
The new tool at Tempco Aircraft Corp., Dallas, Texas, has registered substantial manhour and material savings, at an initial

Bends aircraft tubing . . .

cost about one-fourth that of marketed ball-type mandrels.

A requirement for forming tight radius bends in 2- and 3-in. OD aluminum tubing led to development of the new tool. The company had tried bending the tubing with a straight, plug-type mandrel, but the tubing left unsupported where the bend was made,

CM Hammerlok®
COUPLING LINK
Greatest Chain Development of the Day!



A typical Herc-Alloy chain assembly made up with Hammerlok coupling links.

NO PEENING
NO WELDING
The Hammerlok link is securely locked by the alloy steel pin which bites deeply into the tubular stud. The locking arrangement is hidden and inaccessible.

NOW... you can make up Herc-Alloy chain assemblies yourself...with economy, speed and SAFETY.

HAMMERLOK FEATURES

● SIMPLE ASSEMBLY—Expert help is unnecessary. This link can be properly assembled by anyone who can drive a nail.

● RUGGED DESIGN—The Hammerlok link has been thoroughly field tested. It withstands the severe usage to which alloy chain is so often subjected.

● GREAT STRENGTH—Hammerlok links are stronger than Herc-Alloy chain.

● RE-USEABLE—Hammerlok links can be disassembled and re-used.

● NO WORRY—The human factor plays no part in the assembly or safety of this link, since skill is not required in its assembly.

A BOON TO CHAIN BUYERS AND USERS

No longer do you have to wait for custom made (or repaired) alloy chain assemblies to reach you from the factory. Now you (or your distributor) can stock assorted sizes of Herc-Alloy chain and attachments...plus an assortment of Hammerlok links. Then, when you need a new or rebuilt alloy chain assembly, it can be made up in a jiffy.

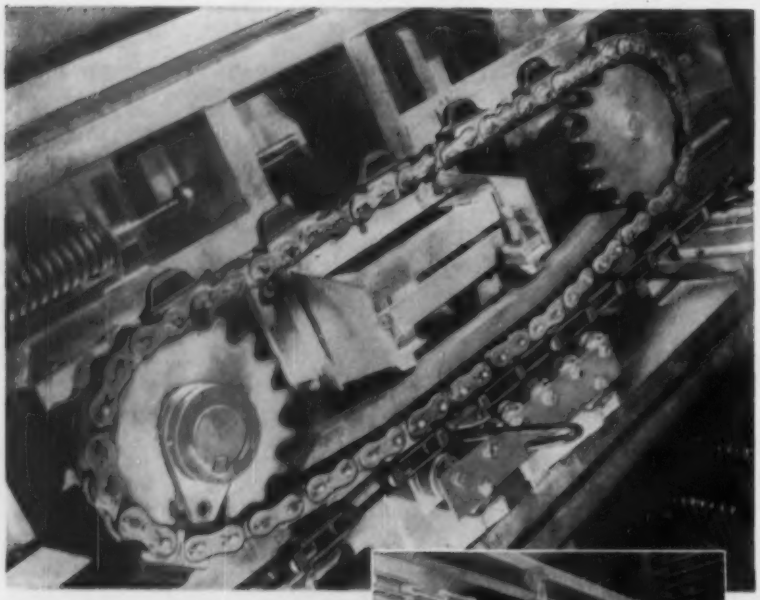
● Ask your distributor about Hammerlok coupling links today.

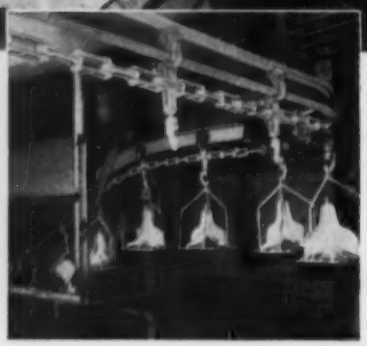
● Write for folder describing use and assembly in detail.

NOTE
Hammerlok coupling links are NOT sold as repair links for body chain. When the body chain in an alloy chain assembly requires repair, the entire section of chain should be replaced or the complete assembly returned to the factory for reconditioning. Hammerlok links ARE recommended for replacing complete sections.

Made by the makers of HERC-ALLOY—the original alloy steel chain

CM HOISTS AND CHAIN
COLUMBUS McKINNON
CHAIN CORPORATION
TONAWANDA, NEW YORK
DISTRICT OFFICES: NEW YORK, CHICAGO, CLEVELAND
In Canada: McKINNON COLUMBUS CHAIN LIMITED, ST. CATHARINES, ONTARIO





You can see the superiority of A-F Conveyor Engineering

Take for instance, the drive unit on an A-F Engineered Conveying System

DO YOU know when a Sprocket type drive unit should be used on an overhead conveying system—or when should a Caterpillar Drive be included in the specifications?

Because of our longer experience in the industry—(A-F founded the package conveyor business in 1901)—you can be sure that A-F Engineers will give you the *right* answer.

So — take a look at any A-F *Engineered* plant-wide conveying system. You'll see not only automatic innovations such as mechanical scales and switches—for a single case or an entire train of cases—electric eye counters and devices that automatically divide a single assembly line into two lines — then back into one line again — but conveying systems that are built to pace your plant at the most efficient speed . . . that are built to need less maintenance . . . less care . . . that are built to step up your production and make money for your company.

Before you order any type of conveyor write us. We'll be glad to submit an estimate. In many cases we will be low. But low — or not — you can be sure your A-F Engineered Conveyor System will be right!

Write For New Trolley Book, Without Obligation, Today!

A-F FOUNDED THE PACKAGE CONVEYOR BUSINESS IN 1901

A-F

A-F *ENGINEERED* CONVEYING SYSTEMS

Also Pre-Engineered Conveyors—Wheel, Trolley
Rack Washers
Metal Cleaning and Processing Machines

THE ALVEY-FERGUSON CO., 556 Disney St., CINCINNATI 9, OHIO and Azusa, California

"Spheres and shank are strung on a cable . . ."

tended to flatten. Twenty pct of parts were being distorted and scrapped.

Different Mandrel Needed

To order ball-type mandrel in the correct size meant delay. So a tool was designed which is similar in appearance to conventional ball-type mandrels. Dished-out steel hemispheres are nested in series on the end of a shank, making a mandrel extension which curves in conformance with tubing.

But instead of attaching the spheres with links which allow the device to swivel in only one direction, spheres and shank are strung on a length of 3/16-in. cable. A shank-type terminal is swaged on one end of the cable, and a ball terminal is swaged on the other end. Thus, the mandrel can swivel in any direction.

Cable Simplifies Fabrication

The cable attachment, taking the place of links that must be machined for conventional ball-type mandrels, simplifies fabrication.

In setting up the mandrel for use on a tube-bending machine, the cable again saves time. With a link-connected tool, the mandrel rod on the machine must be rotated until the bend in the mandrel conforms exactly with the bend in the radius block. This adjustment is unnecessary with the free-swiveling mandrel, and set-up time is reduced about 15 pct.

Always Aligned

Since the 360-degree-swiveling mandrel always is in correct alignment, rejections due to mandrel and radius block being out of line are negligible.

The tool can be adapted quickly for bends of large or small radius. The tighter the radius, the more balls are needed. By using long or short cables, from two to five balls can be strung.

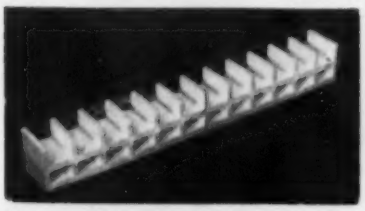
Extrusions:

Aluminum deck panels dissipate heat.

Aluminum's ability to transmit heat rapidly and to be extruded into complex shapes is being utilized in making cooling panels for the decks of aircraft carriers.

Produced at the Halethorpe Md., extrusion plant of Kaiser Aluminum & Chemical Corp., the protective cooling panels are extruded deck sections with multiple holes through which sea water is circulated. Placed in the carrier deck around the plane launching catapults, they dissipate heat from the exhaust blasts of jet planes much as a radiator cools an automobile engine.

Sections are made of 6063 aluminum alloy in T6 temper. Each section is 12 in. wide, and contains 12 longitudinal holes with 13 legs extending beneath them. Sections are produced in four different lengths: 10-ft 4-in., 12-ft, 13-ft 3-in. and 17-ft 8-in.



For cooler carriers . . .

Handling:

Side-loading fork truck proves fast, versatile.

A side-loading industrial fork-lift truck combining features of several other types of equipment has replaced three other handling devices for a southern pipeline supplier.

The supplier formerly required a truck mounted crane to unload pipe from barges, two trucks with pipe trailers to haul it to storage, and a truck with gin pole in the storage yard. Now the sideloader substitutes for three of the equipments. The dock crane is still used to keep the sideloader busy. Work force requirement has been cut from 15 to nine.

Made by Baker-Raulang Co.,

MACHINABILITY INDEX 80-90*

PEARLITIC MALLEABLE CASTINGS

*B1112 STEEL = 100

Low machinability index of 80-90 (B1112 steel = 100) is probably reason enough to warrant serious consideration for your product.

But pearlitic malleable castings—from National—don't stop there. They have great ultimate strength . . . resist wear under heavy loads at high speeds . . . make excellent non-seizing bearings . . . can be air or liquid-quenched . . . can be smooth-finished.

Don't overlook the advantages of pearlitic malleable. For pearlitic malleable castings—from National—can often reduce manufacturing costs, weight and assembly time . . . can increase the sales potential of your product. AA-1806

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY

Cleveland 6, Ohio

The Nation's largest independent producer of malleable and pearlitic malleable

THE *Quality* OF
WALLINGFORD
STAINLESS STEEL
STRIP
stands up under
close inspection

OURS

YOURS

YOUR
CUSTOMER'S

• THINNESSES TO .002".
• ACCURACY TO ± .0001".

Even in this age of automation, quality is no "push-button" accomplishment. Modern machinery still must be teamed with skilled, experienced craftsmen to achieve the ultimate in quality. That's how it is at WALLINGFORD, and that's why WALLINGFORD Stainless Steel Strip stands up under the scrutiny of our advanced design electronic quality control devices . . . will meet your most rigid requirements for tolerance, analysis, temper, uniformity . . . and will pass the final test of customer usage and approval.
You're invited to visit WALLINGFORD soon to see for yourself the excellence of our facilities and personnel . . . and the quality of our product.

THE
WALLINGFORD
STEEL CO.
SINCE 1922
WALLINGFORD, CONN., U.S.A.

STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP • STAINLESS WELDED TUBES AND PIPE

"Can stack and pick up, carry loads parallel to its line of travel, work in narrow aisles . . ."

Cleveland, the unique truck can stack and pick up from stacks like a fork truck. Like a straddle carrier or highway truck, it carries its loads parallel to its direction of travel, and so can operate in aisles little wider than it is.

Automatic Transmission

Especially useful for long loads such as pipe, structural steel and lumber, the sideloader has automatic transmission, hydraulic brakes, power steering, head and tail lights, and even directional signals. Travel speed is 30 mph.

Side-loading . . .

Heat-Treating:

Strip furnace permits one-pass annealing.

Several continuous strip-heating furnaces embodying a new approach to complete elimination of strip burnout and related down-time and rethreading problems are being built for a large steel mill for annealing tin plate.

Selas Corp. of America, Philadelphia, attributes the compact design of the single-vertical pass, gas-fired furnaces to the high speed application of heat possible through direct radiation. This heats the strip to annealing temperature, uniformly and efficiently, in a single-pass furnace chamber and thus avoids strip-tracking problems.

Adjusted to comparable tons per hour the 427-ft. of strip in the heating and cooling zone is

Through this little hub . . .
flows one of humanity's highest hopes

A dreaded shadow lifts, and the clear light of science once again drives back the outer darkness. Such a great event, so close to a miracle, is often then beset with technical problems. How to bring it to the millions who anxiously await it? How to give it to them exactly as it should be given, with scientific precision, for greatest benefit?

In this current contingency, one of mankind's oldest servants meets its opportunity to be of greatest service. That is why a special-shaped Bristol Brass rod is commonly used when forming the precisely dimensioned, tiny hub that is essential to effective administration.

And in supplying special brass for this vital use, all our people here in the Bristol Mills are humbly grateful to have a part.

THE BRISTOL BRASS CORPORATION
Since 1850
in Bristol, Connecticut

BURT VENTILATORS SOLVE LOCATION AND PRODUCTION PROBLEMS FOR OIC VALVES

The Ohio Injector Company, Wadsworth, Ohio — one of the nation's largest manufacturers of industrial valves — had two problems. Their plants are in a valley with almost no natural air movement. Their busy foundries create high heat, fumes and dust. Burt Ventilators solved both. Fifteen 30" Burt Free-Flow Ventilators on their Iron and Bronze Foundry and eleven 36" units on their Brass Foundry change the air every 3½ minutes. In other buildings, carefully spaced 60" Burt Free Exhaust Fan Ventilators provide fast, volume exhaust, changing the air every 4½ to 5 minutes. Workmen praise the system. Production has improved materially.

Burt's 53 years experience engineering and building ventilators is available to solve your problems — without obligation.

Send for **FREE** *Data Book!*

Write for Burt Data Book SPV-101-E. It supplies quick data on Burt's complete line of modern Roof Ventilators.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

The Burt Manufacturing Company

920 S. High St. Akron 11, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION

"Line automatically meets changes in gage and width . . ."

only a fraction of that in other lines. This is an important factor, since loss of strip production time, following shutdowns, is almost proportional to length involved.

Eliminates Strip Burnout

Heating zone can be removed from the strip smoothly and rapidly in automatic response to line shutdown, and returned to position on startup. Strip "burnout" from any cause, including oxidation, parting due to overheating, and related downtime and rethreading problems, are thereby eliminated.

The line automatically meets changes in gage and width of strip. Fuel flow rate is basically governed by exiting temperature of the strip. Rate and distribution of heat application assures uniformity of heating from edge to edge of strip, without need for manual attention for gages and widths within the design range.

The cooling arrangement incorporates retarded cooling and fast cooling zones, and delivers stain-free strip at temperatures far lower than are practicable by other means. This permits final skin-pass rolling without long waiting periods generally required for cooling.

Cutting:

Band saw experts suggest 'fit blade to work.'

Selection of band saw blades for metal-cutting should be guided by the material to be cut. Such factors as number of cutting teeth, their set and operating speed vary with the particular job to be done.

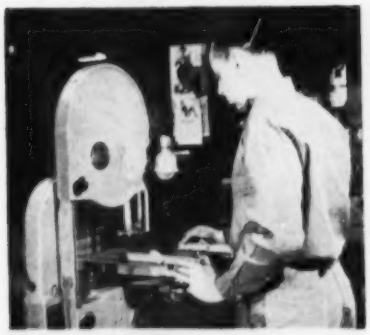
Rockwell-Delta power tool experts says slow speed is needed for conventional metal sawing. Blade speed should be in the neighborhood of 200 surface fpm for average work. Steel requires a slower speed than soft metals, and thick sections a slower speed than thin sections. When blade speed is too high, a skidding, rubbing action

results which fails to cut the metal and also leads to rapid dulling of the blade. As a rule of thumb, the softer the metal, the higher the cutting speed.

Two Teeth Touching

Blades for cutting thin metal should be selected so there will always be at least two teeth in contact with the edge of the work. If teeth are allowed to straddle the work, they will be torn off and the blade ruined.

Three different styles of set are commonly used for metal-cutting blades. Blades with every tooth set, alternating right and left, similar to wood-cuttng blades, can be used for cutting all of the softer metals. "Regular" or "raker" set blades having one unset raker tooth to each pair of set teeth, the raker tooth serving to keep the cut clean, are used for cast iron, steel, Monel, etc. The "wavy" set blade with teeth set in groups, one set of teeth forming a wave to the right, the next set to the left, is extensively used for cutting thin metals



The right blade . . .

such as pipe, metal tubing and radiator cores.

For the General Shop

For the small or general shop, a good selection of blades would be 14, 18 and 24 teeth per inch, with the 18-tooth "regular set" blade being best for all-around work. The coarser toothed blades are excellent for the softer metals, such as copper, brass, aluminum, etc., while the 24-tooth blade is good for cutting thin sheet stock in any metal. Hard-edge blades should be discarded when worn as it is not practical to sharpen them.

DEMING pumps for industry

Pictured above is an example of the adaptability of Deming Vertical Turbine Pumps in the metal producing and metal working industries. This installation is in a midwestern steel plant.

The unit illustrated is a Deming Fig. 4700 Vertical Turbine Pump equipped with a short length of column to place the suction inlet at the proper location.

Hot water alkaline solution at temperatures from 180° to 210°F. is pumped through spray nozzles to a scrubbing machine to clean the acid from steel sheets after the pickling process.

The important advantages of Deming Vertical Turbine Pumps for this type of service are the elimination of priming problems and the ease with which submergence may be provided to prevent vapor locking with liquids near the boiling point.

THE DEMING CO., 566 BROADWAY, SALEM, OHIO

75th ANNIVERSARY DEMING PUMPS 1880 - 1955

The complete line of Deming Industrial Pumps covers a wide range of types, sizes and capacities to meet most requirements of the metal producing and metal working industries. A nationwide network of Deming Distributors assures localized service everywhere. Write for complete details.

Specify DEMING PUMPS

SEE FOR YOURSELF

where FARREL GEAR UNITS get their CAPACITY FOR WORK

As you can see, the full face width of each gear in a Farrel speed reducer is at work, transmitting power.

Instead of a center groove, Farrel gears have a *backbone* formed where the helices meet. This *backbone* provides extra strength, and greater load-carrying and shock capacity – especially important in tough-job applications.

What you can't see, but which is equally important, is that these gears have teeth generated by the famous Farrel-Sykes method—assuring accuracy of tooth spacing, profile and helix angle. This accuracy pays off in smooth, quiet, uniform power flow.

Farrel speed reducers are made in a number of types, with a wide range of ratios and capacities. For more about these long-lived units ask for a copy of bulletin 449.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N.Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Akron, Detroit, Chicago, Memphis, Minneapolis, Fayetteville (N. C.), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

FB-991

Farrel-Birmingham®

Blade is selected with regard to sharpness of curves it must cut . . ."

The blade must be selected with regard to the sharpness of curves which it must cut. A ½-in. blade can not cut a circle less than about a 6-in. diam; a ¼-in. blade will cut a radius of about 1 in. No table of radii capacity can be accepted as other than an approximation.

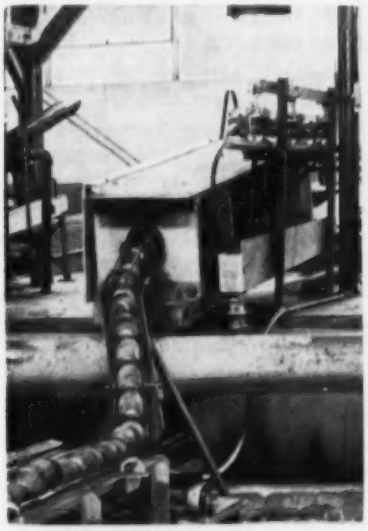
Since most metal-cutting is in the form of straight lines or mild curves, the best all-around blade is ½-in. wide.

Heating:

Low frequency induction method cuts costs.

A new, highly efficient method for low-frequency induction heating requires less initial investment than other induction heating methods and eliminates the need for skilled labor.

Developed by Mullins Mfg. Corp., the equipment will be manufactured by Loftus Engineering Corp., Pittsburgh. It is useful in heating such items as billets,



Flexible heating . . .

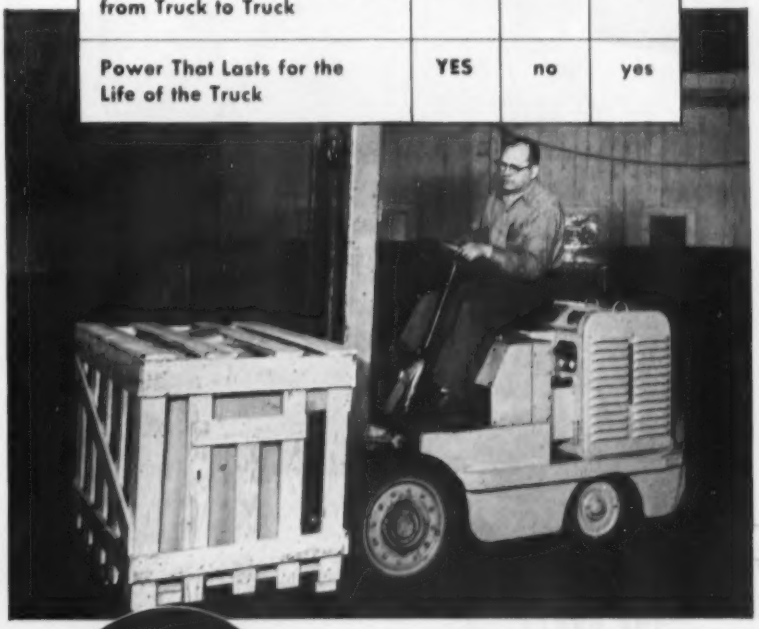
bolts, and rivets to forging and annealing temperatures.

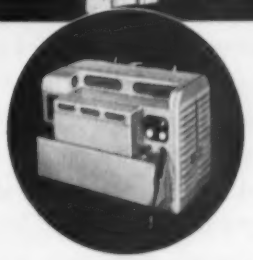
Heats Small Sections

Heating medium is an induction coil using 60-cycle, single phase,

READY-POWER Gives Materials Handling Trucks ALL 5 ADVANTAGES

	READY-POWER UNITS	POWER TYPE A	POWER TYPE B
Simplicity of Electric Drive	YES	yes	no
Maximum Power for Unlimited Periods	YES	no	yes
Off-the-Truck Power Unit Maintenance and Adjustment	YES	yes	no
Power That's Interchangeable from Truck to Truck	YES	yes	no
Power That Lasts for the Life of the Truck	YES	no	yes





Remember, Your Truck is No Better Than its Power

Don't let low "first costs" hide important truck operating advantages. The Ready-Power features, shown above, add up to lowest ton-mile costs, minimum downtime, fleet flexibility, and *profitable* long-range investment.

Only Ready-Power offers removable gas-electric, LPG-electric and diesel-electric power units for all makes and sizes of electric trucks . . . from walkies to 80,000 lb. giants.

Your present electric trucks can be converted to Ready-Power, and you can order new trucks "Ready-Power-equipped". Write for more information.

READY-POWER

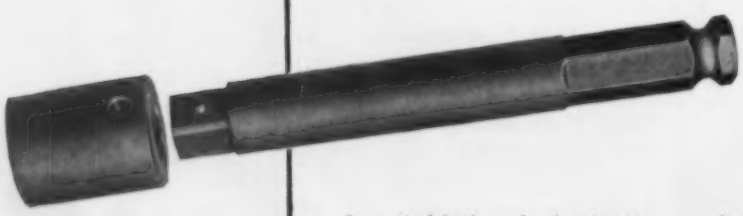
The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electric Power Units for Industrial Trucks

on your nut setting operations-

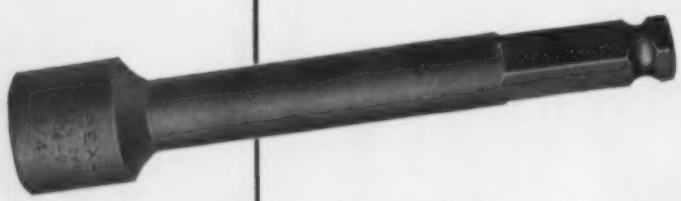
for maximum economy

Apex extensions and impact sockets, built of high carbon electric furnace alloy steel, are specifically designed for continuous, hard usage. When wear finally does occur, you replace only the worn part—socket or extension—your tool replacement costs are kept to a minimum.



for maximum torque

Apex straight (one-piece) nut setters are also built of high carbon electric furnace alloy steel. They have no joints, locking devices or movable parts. This one-piece design eliminates backlash and vibration . . . full torque is developed, as power is applied directly from the tool to the work.



for every nut setting operation

Apex produces a complete line of impact sockets, extensions, adapters and universal wrenches, each designed and built for a specific nut setting operation. Choose from more than 5,000 stock types and sizes . . . or tell us about your special nut setting problem and we'll work right with you to help find the solution. Catalog 29 is available on request—please use your company letterhead.

APEX TOOLS

sockets, extensions, adapters

THE APEX MACHINE & TOOL COMPANY
1029 S. Patterson Blvd. • Dayton 2, Ohio

"Results in low operating costs on small sections . . ."

alternating current. For economical reasons, such units have been utilized in the past for heating items of large section only. The new method results in low operating costs on small sections, comparable to the high-frequency method.

Besides having a lower initial cost than high-frequency equipment, the method's flexibility permits various size sections to be heated in the same coil. This reduces the variety of coils required.

Auxiliary material - handling equipment is also eliminated. In many installations the use of mechanical pushers and conveyors is not required. Even without auxiliary equipment the rate of processing workpieces can be consistently controlled to give uniform results throughout a wide range of temperatures.

73 Pct Efficiency

In developing the improvement under actual work conditions overall performance in production units increased from an efficiency of 48 pct to 73 pct.

Several batteries of 60-cycle, single phase a-c coils are in operation at the company's Warren, O., plant. Coil capacity ranges up to 2,000 lb per hr of processed steel with an energy consumption of one kwhr per 14 lb of metal heated to a temperature of 1350°F.

A given coil has been used to heat 4-in. diameter billets, ¾-in. diameter rivets, or 1-in. diameter bolts.

Bonding:

Rubber coatings held parallel to ±0.004-in.

A method of applying rubber covering to metal castings permits holding covering thickness on a cast iron plate to within ± 0.004-in. of being parallel throughout.

Willow Run Rubber & Lining Co., Belleville, Mich., has processed filter plates in appreciable quantities by the close-tolerance rubber covering method, for shipment to numerous points in the U. S. and in foreign countries. The plates are used in electrochemistry and many other phases of industry.

Stability of parallels and maintenance of close tolerances are attributed by the company to their development of special bonding agents and equipment and to close control of the rubber compounds used for covering the filter plates.

Better Bonding . . .

Standards:

High speed steel samples for laboratory work.

Acknowledging considerable help from the steel industry, National Bureau of Standards now offers six new spectrographic standard samples of high-speed tool steels for laboratory work.

These standards, sold by the bureau at $8 each, are complex alloys of iron, chromium, vanadium, molybdenum, tungsten, and cobalt, with small quantities of other elements. They are available in rods 7/32-in. in diameter and 4 in. long, and rods ½-in. in diameter and 2 in. long.

Fine-Grain Structure

Rods have a uniform fine-grain structure resulting from hot-rolling and annealing of the cast

CASH IN YOUR CHIPS

Change Metal Turnings Waste into More Profitable Shoveling CHIPS

American METAL TURNINGS CRUSHERS

No progressive, profit-conscious company—who produces 10 or more tons of metal turnings per month—can afford to ignore the profit potential of a modern chip salvage system . . . with an American Metal Turnings Crusher at the core.

American installation profits include: $4 more per ton for chips than for machine turnings; up to 50 gallons per ton in cutting oil recovery; 75% less storage; easier, faster handling.

How many profit dollars are you losing under present operations? If, for example, you're currently producing 20 tons of turnings a month . . .

THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!

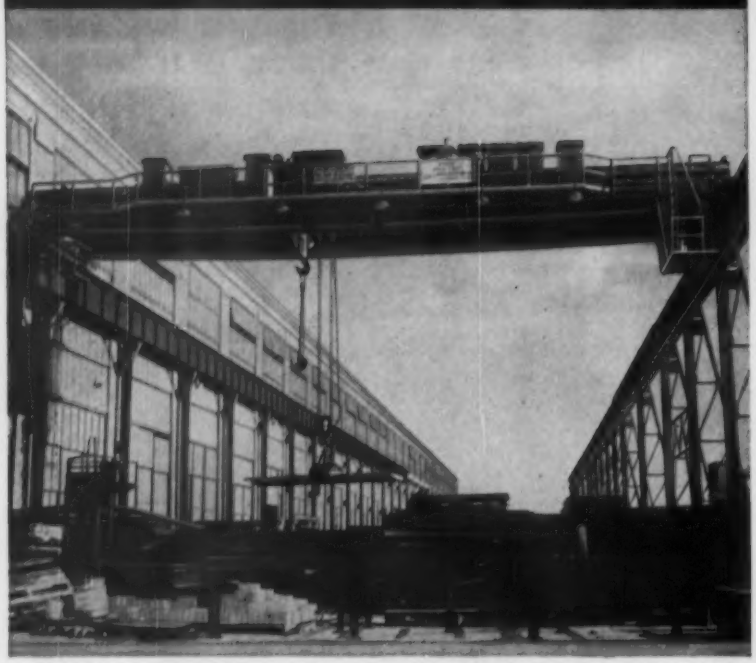
240 Tons Metal Turnings per Year (20 tons/month at $4 extra per ton)	$ 960.00
6,000 Gallons Recovered Cutting Oil at 30¢/Gal. (50 gals. per ton x 240 tons = 12,000 gals. Half of this, 6,000 gals., can be credited to use of chips instead of turnings in reclamation)	$1,800.00
Estimated Savings in Manpower, Storage, Tools, Maintenance, Freight, etc.	$ 300.00
TOTAL GROSS PROFIT	$3,060.00

WRITE for Metal Turnings Crusher Bulletin.

American PULVERIZER COMPANY

1439 MACKLIND AVE. • ST. LOUIS 10, MO.

Look Overhead . . . see "NORTHERN"



For heavy, continuous service in steel storage yards

The 40-ton, 75-foot span, heavy duty crane shown above is typical of many similar NORTHERN CRANE installations in steel mills, fabricating plants, and similar plants in heavy industry.

NORTHERN mill type cranes are designed and built to meet the most exacting requirements, providing for continuous service, maximum loads, and high impact allowances. Mill type motors and control equipment provide highest electrical performance.

NORTHERN CRANES are the result of over 55 years' experience in the design of overhead electric traveling cranes, heavy duty electric hoists and other materials handling equipment.

Let us send you our latest bulletins

NORTHERN MATERIALS HANDLING EQUIPMENT

NORTHERN ENGINEERING WORKS
210 CHENE ST., DETROIT 7, MICH.

"Can be applied directly to the analysis of molybdenum and tungsten high speed tool steels . . ."

metal. They can be applied directly to the analysis of molybdenum and tungsten high-speed tool steels made in a similar manner and in similar shapes.

Bethlehem Steel Co. prepared the several heats of metal with the desired compositions and fabricated the metal into rods. Bethlehem, Crucible Steel Co., Cleveland Twist Drill Co., Carpenter Steel Co., and the bureau made chemical analyses of representative rods.

New standard samples . . .

Foundry:

permanent molds cut casting costs.

A Cleveland foundry, making permanent molds from Meehanite castings, has increased weight of aluminum castings from 350 to 780 lb while saving half the former costs.

A Government contract required Harsch Bronze & Aluminum Foundry to produce a large number of hollow aluminum turbo-blower rotors, the whole body and internal flanges to be covered with chills. To reduce labor necessary to set chills and to meet a new 10 pct higher specification in physical properties, it was decided to incorporate a collapsible iron core and make a completely permanent mold.

Properties Sought

Meehanite metal was chosen for casting the permanent molds because of its high strength maintained at elevated temperatures,

GLOBE

Ferrosilicons
High-Carbon Ferrochromes
Low-Carbon Ferrochromes
Low-Carbon Ferrochrome Silicons
Silicomanganese
And Other Specialty Alloys

Put into operation this year, Globe's new plant is the most modern in the country. Located at Beverly, Ohio, it is ideally situated for distribution of its diversified line of ferroalloy products by rail, water and truck. With five electric furnaces, Globe has a combined capacity of 32,000 KVA.

The company is staffed with highly competent and experienced operators, research and metallurgical engineers. They are available for consultation on any problem involving the use of ferroalloys.

May we discuss your needs with you?

Ferrosilicons—Made from high quality raw materials assuring a clean metal, free from segregation and inclusions. Plants at both Beverly and Jackson, O.

SILVERY IRON
GLOBE
FERROALLOYS

PICKANDS MATHER & CO.

CLEVELAND 14, OHIO

CHICAGO • CINCINNATI • DETROIT • DULUTH
ERIE • GREENSBORO • ST. LOUIS • WASHINGTON

Serving Industry Since 1883

IRON ORE • PIG IRON • COAL • COKE • FERROALLOYS

What a big difference in *comfort* the HINGED BRIDGE makes!

Your workers will say they never had comfort like they get in the new Willson Contour-Spec—and its new hinged bridge adds an extra measure of protection, too!

It's the *hinge* that permits equal pressure at every point of contact with the face . . . snug comfort regardless of facial contour! And it's the hinged bridge that means extra safety because there are no dangerous gaps around the eyes.

Contour-Specs conform to *any* face—heavy, lean, round, long or bony! Result is, a new concept of comfort combined with protection that encourages workers to wear them willingly.

Let them try Contour-Specs—see how well the 47-mm. lenses suit every eye size—feel how easily the lightweight, snug-fitting Butyrate plastic frame "sits" without pressure anywhere. Order a supply from your Willson distributor now.

NEW *Contour-Spec*®

SAFETY SPECTACLES BY . . .

Design Patent 168985

More than 300 Safety Products Carry This Famous Trademark

WILLSON®

Leaders in Research and Development of Safety Equipment Since 1870

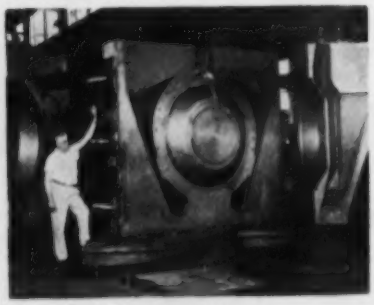
231 WASHINGTON ST., READING, PA.

"Faster cooling produces desired increase in physical properties . . ."

rigidity, and high resistance to corrosion, wear, thermal shock, warping and washing. Requirements were presented to Fulton Foundry & Machine Co., Inc., Cleveland, and the first mold was made.

The new mold made faster cooling possible, in turn producing the required increase in physical properties of the aluminum castings. Where seven men had been able to produce only four castings per day using sand molds, four men could now produce 20 castings.

Core room floor space was eliminated. The mold produced 2500 castings.



Long-lived mold . . .

Hosing:

Furnace door hose survives 637 heats.

A rubber hose that conducts water to cool the doors of open hearth furnaces has survived 637 heats, the longest service record ever set by a hose of its type.

The B. F. Goodrich Co.'s Industrial Products Div. had the hose on test at a Pittsburgh steel plant for 360 days. It was still flexible, uncrushed and in serviceable condition when finally removed. The new hose, armored with wire for strength and protected by asbestos for heat, defied molten steel and white-hot flame throughout the record number of heats.

No Slag Buildup

Due to a newly developed hose construction, slag did not build-up on the hose.

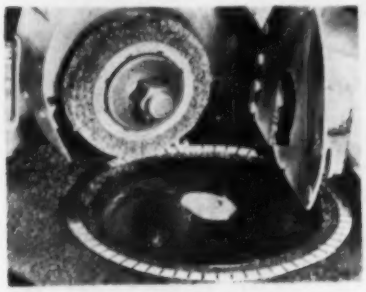
Hose is required for the unusual furnace door application to permit a flexible connection to the water circulation system of furnaces so that doors may be opened to charge the furnaces. Because of its light weight and flexibility, the new hose may be installed by one man.

Cleaning:

Brush cleans contacts quickly, uniformly.

Large circular brass contacts for rheostats are being cleaned of varnish impregnation cleanly and uniformly, and without damage to asbestos background, by the use of power brushes.

The rheostat is placed on a small, free - rotating turntable which is adjustable in a horizontal plane to accommodate several sizes of plates. The whole assembly is lowered and raised by a foot pedal. The plate is put on in a lowered position, raised to brush contact, rotated by hand and then lowered to remove.



Cleans contacts . . .

The Osborn Mfg. Co., Cleveland, makes the 6-in. diam, 0.0018-in. wire brushes.

Fastenings:

Tote-template saves time and bolts.

Development of a simple template has resulted in a saving of workers' time and improved control over the inventory of expensive bolts used in various aircraft components.

Glenn L. Martin Co., Baltimore, uses hundreds of high-strength, close-tolerance bolts in fabricating the aircraft assemblies. The tem-

EVEN if the cost per piece is actually higher, if the gears you use in your product are precision-engineered by Perkins, the *heart* of your product — its power transmission system — will function more efficiently. This factor is especially valuable when automation enters the production picture. In that case, *lack of functional precision*, could easily result in speeding up the manufacture of faulty products — a truly horrendous possibility.

Figured on the basis of trouble-free performance alone, the ultimate cost of Perkins Gears is considerably lower than their initial cost-per-piece would indicate. Best of all, even the initial cost of Perkins custom-made Gears may be competitive. And that is something you can quickly and easily determine by asking us to quote on your requirements.

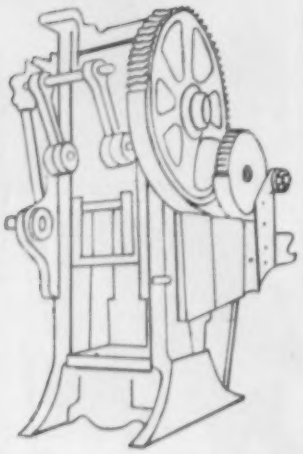
PERKINS MAKES:

to customers' specifications, in all materials, metallic and non-metallic: bevel gears, ratchets, sprockets, ground thread worms, spiral gears, helical gears, spur gears with shaved or ground teeth.

NOTE: The PERKINS PRECISION SPRING COILER is the latest development in the spring coiler field and eliminates entirely the use of arbors and long set-up time. It is a complete self-sufficient machine and enables you to make the spring you want when you want it — in seconds. The coiler produces any type of spring, in any diameter and any pitch with this range: Wire sizes .005 to .125. Diameter, from 3/32" to 12" and larger. Size of the compact coiler is only 7 1/2x16". A POWER MODEL is available. Information on request.

PERKINS MACHINE & GEAR CO.
103 Circuit Ave., WEST SPRINGFIELD, MASSACHUSETTS

LET SIMMONS REBUILD AND MODERNIZE YOUR PRESSES



Investigate the important production, maintenance and tax savings of SIMMONS ENGINEERED REBUILDING for your: Lathes, Planers, Surface Grinders, Cylindrical Grinders, Vertical Millers, Openside Planers, Automatics, Vertical Boring Mills, Turret Lathes and Radial Drills.

A qualified Simmons rebuilding engineer will discuss it with you. Write, wire or phone today. Simmons Machine Tool Corporation, 1721 North Broadway, Albany 1, N. Y.

SIMMONS GIVES MACHINE TOOLS A NEW LEASE ON LIFE

Unconditional guarantee . . . our standard since 1910

"And remember this Pete? The first die you ever made for us with Columbia OILDIE!"

COLUMBIA TOOL STEEL COMPANY • CHICAGO HEIGHTS, ILL.

Producers of fine tool steels — All types immediately available through Sales Offices, Warehouses and Representatives in Principal Cities.

TOOL COLUMBIA STEELS

"Indicates correct size and type of bolt for each hole . . ."

plate, which simulates the bolt holes in the particular assembly and is marked to indicate correct size and type of bolt for each hole, permits the worker to make just one trip to stock bins, to load the template with the indicated bolts.

There is no unnecessary searching to find the right bolt and no running back and forth to stock bins.

Timesaver . . .

Abrasives:

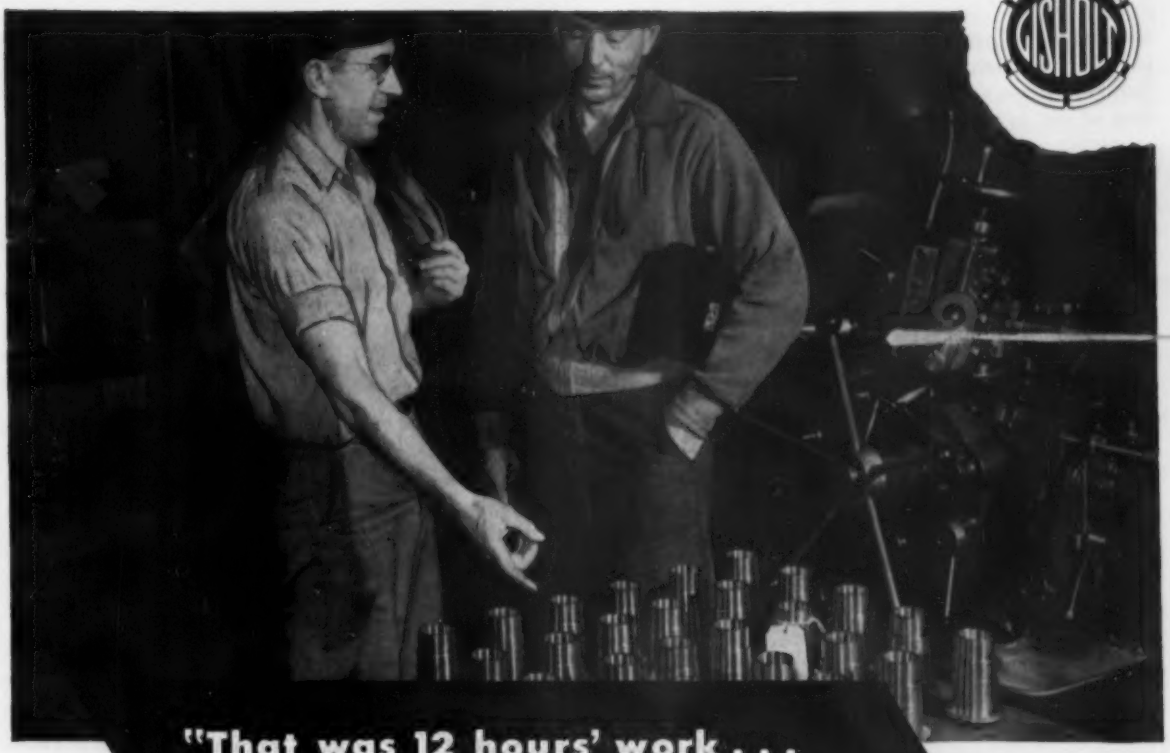
Cut-off wheels produce faster, cooler cut.

A new line of cut off wheels give longer wheel life with equal quality of cut or a better quality of cut for the same wheel life when compared with existing wheels of the same type.

Announced by Bonded Abrasives Div. of the Carborundum Co., Niagara Falls, N. Y., the new line of aluminum oxide resinoid cut off wheels are said to combine all of the desirable qualities essential to dry production metal cut off operations. They have been shown, in extensive laboratory and production field tests, to produce a faster, cooler cut, because of the characteristics of the new type bond.

Prevents Binding

A special process in the manufacture produces sharp sides on



"That was 12 hours' work . . .

NOW WE DO IT IN 8!"

Yes, the operators who've struggled along with older turret lathes will tell you: A 50% increase in production is not unusual when you replace with new Gisholt Ram Type machines.

Many of the old manually operated functions have now become automatic. They're so much simpler and easier to run that you can't help but get more efficiency. Selective automatic speed changing gives instant changes between high and low spindle speeds. There's hydraulic clutching and braking—no effort. Automatic indexing and clamping of the hexagon turret saves more time. These are a few of the modern features that give you the smooth production rhythm that insures higher overall efficiency.

Add to these the power and rigidity to take multiple cuts and you have the unbeatable combination that means bigger production and lower costs. It's the performance that will "buy off" your older machines. Replace with modern Gisholt Turret Lathes.

THE GISHOLT ROUND TABLE *represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.*

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES · AUTOMATIC LATHES · SUPERFINISHERS · BALANCERS · SPECIAL MACHINES

all wheels to prevent binding in the cut. The high bond strength of the wheels combines with the freedom of cut to produce trouble-free operation.

Three grades are available. Grade "R" is for operations that require minimum burn and burr. Grade "T" is for general purpose work where some burn and burring is acceptable. Grade "V" is for rough work where maximum wheel life is the most important consideration.

Size Ranges

Wheel sizes range from 6 to 20 in. in diameter, and are available in 1/16, 3/32 and ⅛-in. thicknesses. Metal bushings are supplied on all arbor holes in the range of ⅝ to 1⅜-in.

All wheels are available in 24 to 120 grit. Intermediate grade action can be obtained by grit selections within this range. Selecting a coarser grit will produce harder cutting action; a finer grit, softer cutting action.

American
BROACHING gives you FLEXIBILITY plus HIGH OUTPUT

ANOTHER *American* FIRST

- 30 different universal joint yokes broached on one machine
- Broaching strokes from 48" to 72" used to broach parts
- Variable speeds—35 to 45 second cycle
- Two or four station operation
- Combination round and spline broaches
- Up to 400 parts per hour

Whether you need flexibility in broaching — to enable one machine to handle many parts — or volume production on a single part, American engineering will give you the combination of broaching machine, fixtures and broaches that will assure you maximum high output. To get American's recommendations, write today giving details of your broaching requirements —or ask for new Catalog 450.

AMERICAN *American* BROACH & MACHINE CO.
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.
ANN ARBOR, MICHIGAN
See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

Power:

Bus for big generator has new high rating.

Bus for the 260,000 kva conductor-cooled generator to be installed later this year in Eastlake power station of The Cleveland Electric Illuminating Co. will carry 10,000 amperes, highest rating ever built.

The aluminum bus conductors are unit-supported, with a single insulator at each support point, so that insulation reliability is improved by reducing the number of parallel paths to ground compared with the older multiple-insulator design. Forced-air cooling is employed for the first time in isolated phase bus. This results in a reduction in physical size, saving weight during installation.

Space Reduced 25 Pct

Space required in the building design was reduced by 25 pct over self-cooled designs, an important

10,000 amp bus . . .

consideration in the cramped confines of a large turbine-generator foundation. Bus sections are only 30-in. square.

Hardfacing:

Electrode has high corrosion, abrasion resistance.

A new hard-facing electrode developed especially for use where high corrosion and high abrasion at elevated temperatures are encountered retains virtually all its characteristics at red heat, and produces a smooth, bright, non-

oxidized deposit free from any porosity.

Made by Mir-O-Col Alloy Co. of Los Angeles, the new alloy flows readily to clean base metal, giving minimum penetration. It is especially suited for hard facing valves, tongs, chemical equipment and food machinery equipment.

50-52 Rc Hardness

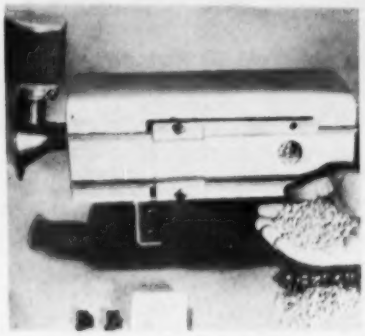
A high cast alloy rod of the nonferrous type, containing cobalt, chrome and tungsten, the electrode has a hardness of 50-52 Rc as deposited. Due to its high hardness, it is recommended where only moderate impact is encountered.

Application can be by either acetylene or electric ac-dc. Under normal conditions electric deposits are slightly lower in hardness than acetylene deposits.

Chemicals:

Catalyst muffler solves engine exhaust problem.

A new muffler solves the engine exhaust problem of industrial plant vehicles using leaded gasoline, eliminating by catalytic burning as much as 90 percent of the carbon monoxide, and most



Catalytic cleaner . . .

of the aldehyde and hydrocarbon fumes.

High fume clean-up of the device produced by Oxy-Catalyst, Inc., Wayne, Pa., as a replacement for the standard acoustical muffler, eliminates worker annoyance and irritation caused by industrial truck fumes and permits safer operation of vehicles in enclosed plant areas. The muffler comes in three basic sizes, for engines with piston displacements ranging from 0 to 75, 76 to 150, and 151 to 230 cubic in.

Pellet Beds

Inside the new muffler are a number of chambers containing beds of tiny catalyst pellets. Fume-laden exhaust gases flow down through the beds and are burned by catalytic chemical action to a safe, odorless exhaust of CO_2 and water vapor.

From a cold start, operation of the engine under load or at high speed idling for 3 to 5 min. is sufficient to bring the catalyst up to operating temperature.

600 Hours

The muffler will provide 90 pct clean-up or more for at least 600 operating hours—the equivalent of about 5 mos fork lift truck performance in many plant operations.

When efficiency drops below the level desired, the catalyst pellets can be quickly removed and replaced with fresh ones.

ROTO FINISH

it's the finish that counts!

Roto-Finish maintains exact tolerances on precision parts with no significant dimensional changes. It makes possible a wide range of finishes applicable to parts of almost any size or shape; finishes a variety of materials — at big savings in manpower and costs. Without obligation, send sample unfinished parts to us. Include finished part for guide and your specifications. Roto-Finish will finish parts in its laboratory. You get a complete process report. You are guaranteed results and a finish that counts!

WRITE FOR FACT-PACKED ROTO-FINISH CATALOG NOW

Roto-Finish COMPANY

3712 Milham Road, Kalamazoo, Michigan

Originators of the Roto-Finish Process

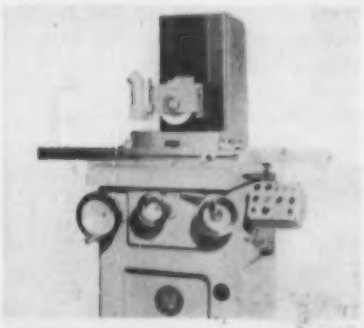
P. O. Box 988

Phone 3-5578

REPORT

MACHINE TOOL SHOW CHICAGO

Items described here are among those viewed with great interest by thousands of metalworking-executive visitors to The Machine Tool Show. The exposition, which opened September 6 at Chicago's International Amphitheatre, will ring down the curtain Saturday, September 17 at 5:00 pm.



Automatic grinder produces high quality surfaces

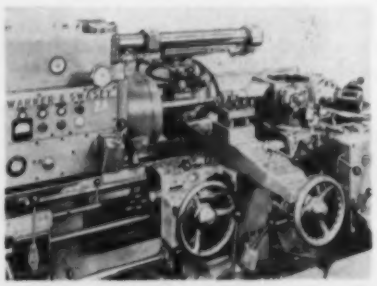
New Reid-O-Matic, Model 618-PF is a fully electric powered, push-button automatic 6 x 8 in. grinder of heavy construction for use in production line or tool room grinding. It is said to produce high quality surface finishes, and is designed for simple finger-tip operational control from a convenient panel Dial controlled speed of the table is variable from 0 to 70 fpm in infinitely fine degrees. Table reversal is accomplished without reversing the driving motor. Cross-feed drive is dial controlled for infinitely fine adjustments. Automatic lubrication to all way surfaces operates continuously. *Reid Brothers Co., Inc.*

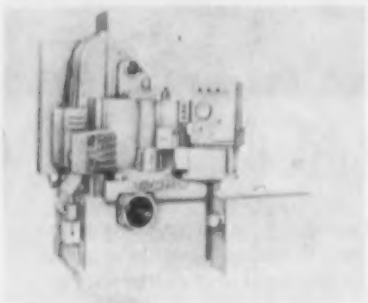
For more data circle No. 40 on postcard, p. 153.

Tracer accurately controls rough and finish cuts

A new hydraulic contour tracing attachment for contour turning and facing work, uses either flat or round templates as the master pattern. The tracer provides accurate control of both rough and finish cuts. The unit is designed for mounting at a 45° angle on the rear of the cross slide of a particular turret lathe. It is intended for operation with the machine spindle rotating in the reverse direction. This is said to cause cut-pressure to be concentrated downward into the cross slide and rear bedway, thus obtaining greater rigidity and accuracy. *Warner & Swasey Co.*

For more data circle No. 41 on postcard, p. 153.





Surface grinder designed to cut downtime

A high production, 6 in. twin rotary surface grinder has been designed to eliminate the downtime of loading and unloading a surface grinder. The machine has two work tables with 180° automatic indexing cycle. One of the main features of the machine is the setting of the cut to contact the work piece automatically and then feed to size, spark out and index. The machine is also equipped with automatic gaging so that when parts are removed they are completely inspected for size thickness assuring the accurate production of parts at high output. *The Thompson Grinder Co.*

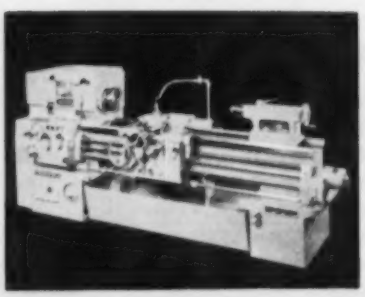
For more data circle No. 42 on postcard, p. 153.

Features functional cabinet, simple controls

Featuring a cabinet redesigned along functional lines and a regrouping of controls for greater simplicity, the new Model 280 lathe is available in either engine or tool room type. Built in 16-in. heavy duty size, the lathe has a totally enclosed head with pressure lubrication to all gears; totally enclosed apron and gear box, running in oil; a lightweight unbreakable fiberglass cover protecting the end gearing; and equilateral triangular girthing of the beds. Key rotating parts are dynamically balanced for minimum vibration and chatter and for greater precision. *Springfield Machine Tool Co.*

For more data circle No. 43 on postcard, p. 153.

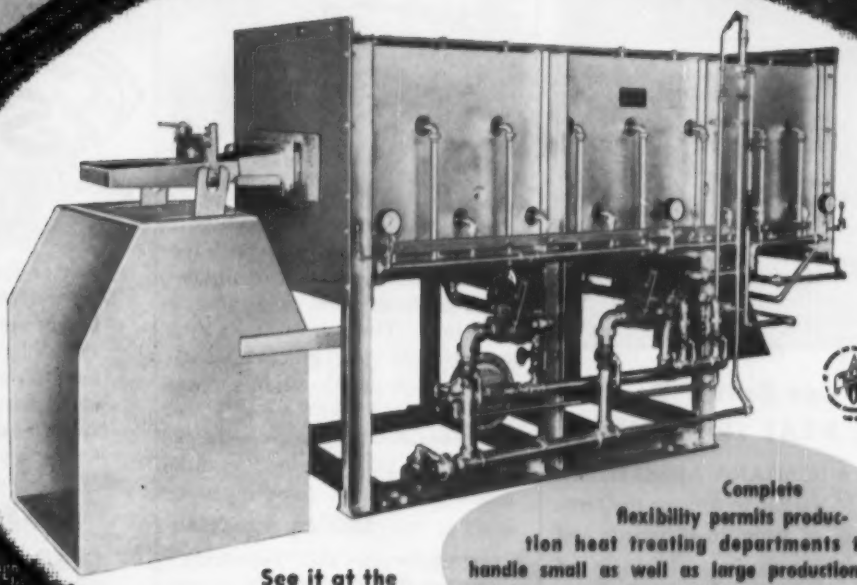
Turn Page



New: RECIPROCATING HEARTH FURNACE

Patent 2,671,654

by AGF Pioneers, the originators and builders of Reciprocating Furnaces since 1921. Features include stationary muffle and complete atmosphere control.



See it at the METAL SHOW Booth No. 1914

Complete flexibility permits production heat treating departments to handle small as well as large production lots on a continuous basis.

Carburizing, case hardening, Ni-Carb process of ammonia-gas carburizing, clean hardening, etc. of parts ranging from balls for ball point pens to heavy forgings can be accomplished with ease in the same model without any modification.

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Individualized treatment assures uniformity of product. Each piece is individually heated, subjected to the atmosphere and quenched. Disadvantages of batch heating and quenching are eliminated. Work can be observed throughout the processing cycle.

Only the work enters and leaves the heating chamber. Baskets, trays, chains and other troublesome mechanisms are completely eliminated.

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Write for Bulletin No. 120

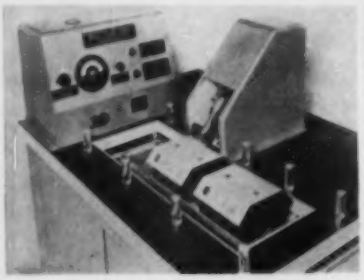
NIAGARA BLOWER COMPANY

Dept. IA, 405 Lexington Ave.
NEW YORK 17, N. Y.

District Engineers in Principal Cities of U. S. and Canada

Air-electric gage

Machine tools and accessories, magnetic chucks, fixed gages, air gages and small tools were included in the Taft-Pierce exhibit. An automatic air-electric gage was in operation. This unit simulates an actual gaging setup in an automotive production line, where the

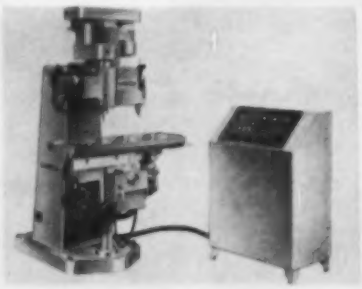


ID of the eight cylinder bores in V-8 engine blocks are simultaneously inspected after rough boring operations. The unit utilizes a contact-type air gaging head to accurately gage on the rough surface of the bores. *Taft-Pierce Mfg. Co.*

For more data circle No. 44 on postcard, p. 153.

Milling machine

A new duplicator, the "Velvetrace" milling machine is capable of reproducing within its 12 x 9 in. work capacity, the fine details of virtually any 3-dimensional model



to an extremely high accuracy. The tracer system utilizes a very minute spark gap of harmless, high voltage, low amperage current between the tracer and the model. Since there is no contact, there can be no damage to any model. In this system there is no deflection or mechanical motion in the tracer and no time lag. *Pratt & Whitney.*

For more data circle No. 45 on postcard, p. 153.

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INDUSTRIAL CUT GEARS

LARGE OR SMALL HEAT TREATED OR PLAIN

SIMONDS has over 60 years' experience in cutting quality industrial gears. We can supply any type of gear in cast or forged steel, gray iron, bronze, Meehanite, rawhide or bakelite in a full range of sizes adaptable to the material. Also heat-treated, case or flame hardened gears of carbon or alloy steel. Send us your requirements for quotation.

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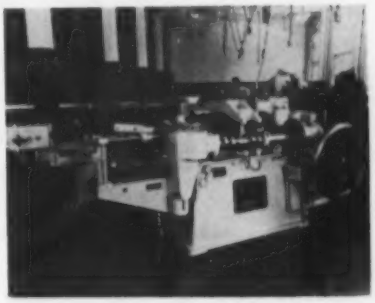
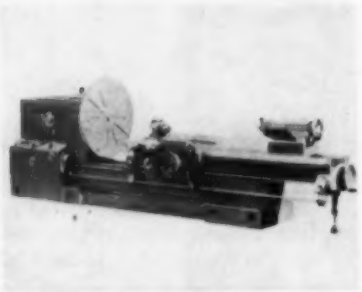
Completes part at each stroke of machine



A multi-slide machine arranged with a tapping unit and a set of tools produces a complete formed metal stamping including the piercing, extruding and tapping of a 6-32 hole. Coil stock is fed into the machine and the complete parts drop out, one at each stroke. Basically, it is a machine which combines all of the operations usually accomplished by a battery of presses. Incorporation of a tapping operation enhances its versatility by eliminating the need for a secondary tapping operation. The variety of parts that can be economically produced in the Multi-Slide is said to be practically unlimited. *U. S. Tool Co., Inc.*

For more data circle No. 46 on postcard, p. 153.

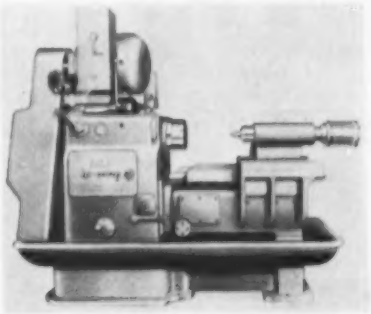
Extension bed gap lathe offers 18 spindle speeds



New Imperial extension bed gap lathe swings 24½ in. over the ways and 42 in. through the gap. All heavy components, including the heavy duty tailstock and the sliding upper bed, are power actuated, require no effort on the part of operator to move them. With a single speed motor, the Imperial delivers 18 spindle speeds 11 to 666 rpm, or 16 to 1000 rpm. With a 2-speed motor, 36 spindle speeds are available ranging from 5 to 666 rpm or 8 to 1000 rpm. The entire gear train is lubricated automatically with an oil spray. Quick change gear box offers wide selection of 60 feeds and threads through a selector. *Nebel Machine Tool Corp.*

For more data circle No. 47 on postcard, p. 153.

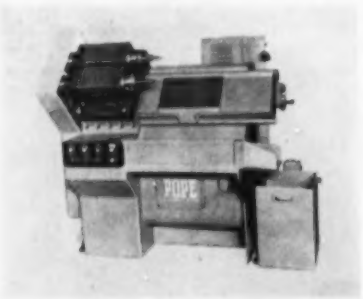
Chucking machine has large swing capacity



The model LN platen type Lo-Swing lathe was designed principally as a chucking machine adaptable to a wide variety of work requiring large swing capacity, high spindle speeds, multiple tooling and fast cycle operation. The machine is fully automatic, cam operated and has sufficient mass and adequate tool support. While this lathe will be used principally as a chucking machine, the bed has been designed for mounting an air-operated tail stock on a bridge which joins the front and rear sections of the bed without obstructing platen movement. *Seneca Falls Machine Co.*

For more data circle No. 48 on postcard, p. 153.

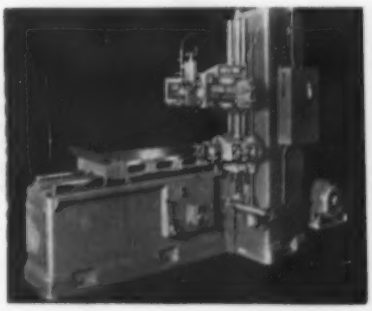
New boring machine has high versatility



The new Pope R-2 super-precision boring machine has a number of features that interested Show visitors. A multi-spindle, single end machine of 9 in. table stroke, it combines electrical control and mechanical rotating operation in such a way as to achieve extraordinary simplicity and versatility. It involves no cams, no change gears, no sprockets, no linkages. It provides infinitely variable feed and traverse rates. The automatic operating cycle includes a timed loading period when desired. The table bearing surfaces are hard chrome plated. *Pope Machinery Corp.*

For more data circle No. 49 on postcard, p. 153.

Hydraulic shaper offers maximum flexibility



With its hydraulic feed and speed, the openside shaper is well-suited for the production of high quality work at low cost. On work over 28-in. long it overcomes the limitations of ram-type shapers by reciprocating the work over the work piece instead of the cutting tool. All work is carried on a rigged box section table which is supported at all points in its travel by a double-length bed. It thus provides planer accuracy and much easier setup and handling for the large-size shaper work. A new model of the hydraulic openside planer was exhibited. *Rockford Machine Tool Co.*

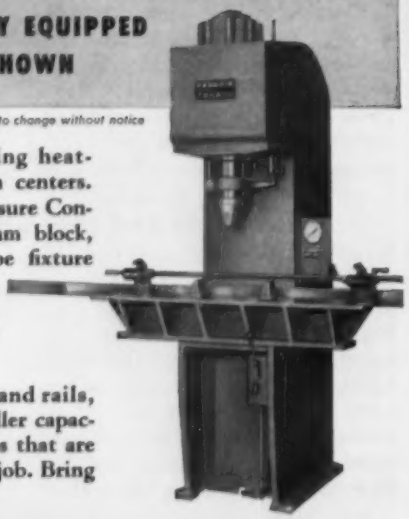
For more data circle No. 50 on postcard, p. 153.

Turn Page

This 25-TON Hannifin Straightening Press Sells For

$4,179 FULLY EQUIPPED AS SHOWN

Price F.O.B. our press plant at St. Marys, Ohio, subject to change without notice



The ideal press for straightening heat-treated parts up to 60" between centers. Exclusive Hannifin Sensitive Pressure Control for speed and accuracy. Ram block, two table blocks and center-type fixture complete with rails included.

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Hannifin offers longer tables and rails, roller-type fixtures, larger or smaller capacities (5 to 150 tons)—all at prices that are easily justified by savings on the job. Bring us your straightening problems.

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You'll see Ruthman Gusher Pumps on many of the important new machines at the Machine Tool and Production Engineering Show, because leading machine tool manufacturers know that Gusher Coolant Pumps are precision built specially for the exacting requirements of Machine Tools. Specify Gusher Pumps on your new equipment for best results.

MODEL 11021

THE RUTHMAN MACHINERY CO.

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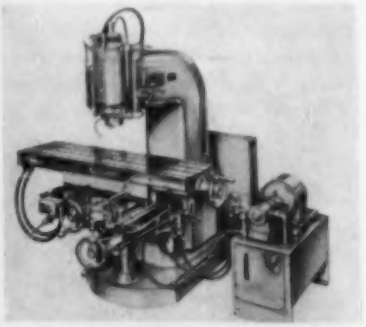
Milling machine

This medium sized vertical milling machine features power table feed in all directions, manual control instantly without stopping the hydraulic system, and a two-speed

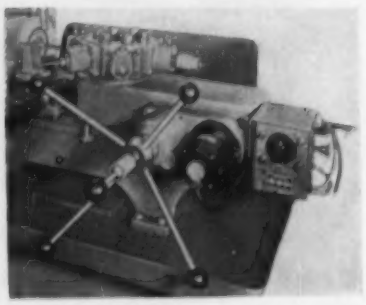


7.5/15 hp Onsrud liquid cooled induction cutting head. Other machines shown included three high speed nonferrous metal milling machines, portable grinders, portable routers and cutters. *Onsrud Machine Works, Inc.*

For more data circle No. 51 on postcard, p. 153.

Electric power feed

Better, more productive performance and greater versatility are claimed for a new electric power feed for the No. 601 Rapiduction turret lathe. Operating independently of the spindle drive motor, its rate of feed can be changed at will without stopping the machine



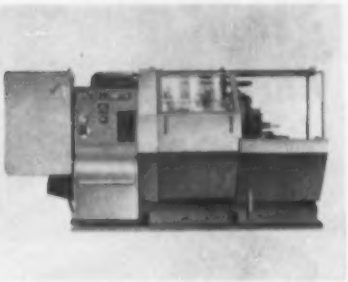
and shifting gears. Within its range, an infinite number of feeds are available to use for efficient chip removal and surface finish desired. Since it is a complete unit, it is available for easy installation on machines already in use as well as on new equipment. It bolts on to turret carriage. *Oster Mfg. Co.*

For more data circle No. 52 on postcard, p. 153.

Automatic turret lathe designed for carbides

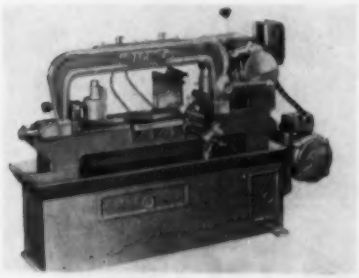
Designed to take full advantage of carbide cutting tools, the Potter & Johnson 4-U automatic turret lathe can handle unusually tough jobs on hard-to-machine new alloys. To insure increased stiffness and rigidity, the bed is a heavy, steel weldment with ample ribbing. Chuck sizes are 10, 12 and 15 in. There are 6 automatic feed changes, and 4 automatic speed changes from 45 to 1177 rpm. Motors from 15 to 25 hp can be specified as required. Adjustable independent cross slides can be operated individually or in tandem with any turret face. *Potter & Johnson Co.*

For more data circle No. 53 on postcard, p. 153.



Hydraulic utility saw

Wide utility with large capacity are featured in the Model 816 saw. It will handle the full range of general cut-off work from tough tool steel and dies to mild bars, tubing, and structural shapes up to 8 x 16 in. A simple limit switch allows an efficient drive, eliminating the need of a clutch. There are no trains of gears, levers and ratchet devices. At the completion of each cut the motor is stopped and the saw frame automatically rises to its highest point. *Racine Hydraulics & Machinery, Inc.*



For more data circle No. 54 on postcard, p. 153.

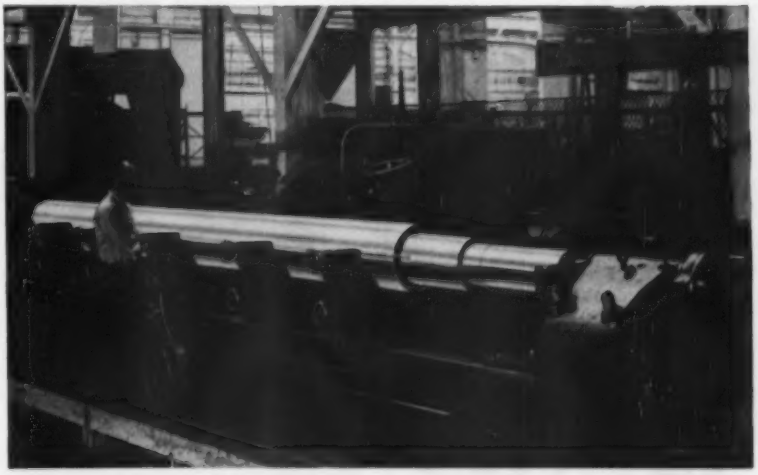
Turret punch presses

New presses combine the speed of a punch press, turrets carrying 12 to 32 punches and dies, and a quick-setting mechanical work positioning gage, to perform all phases of the Wiedemann method for short run production. These machines are said to provide the most economical method of locating and punching holes in flat sheet metal and plates when production is in low to medium lots. They eliminate set-up, layout and other preparatory problems in practically all punch press work in which the quantity does not warrant a die set. *Wiedemann Machine Co.*

For more data circle No. 55 on postcard, p. 153.

Turn Page

STEEL MILL ROLLS
by
TITUSVILLE FORGE



ALL TYPES AND SIZES FORGED AND GROUND TO YOUR SPECIFICATIONS

Plate rolls—bending rolls—back up rolls—straightening rolls—table rollers and other mill rolls are dependably forged and ground in any size—to any specification at Titusville Forge. Illustrated above is a straightening roll being ground on our 42" Landis Grinder. Size is 16" diameter x 28'3½" long, 40/45 scleriscope hardness.

Rely on Titusville Forge for mill rolls that meet your specific requirements.

Struthers Wells

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TITUSVILLE FORGE DIVISION
TITUSVILLE, PA.
PLANTS AT TITUSVILLE, PA., and WARREN, PA.
Offices in Principal Cities

Grinds face mills

Designed to overcome difficulties in grinding close pitch carbide face mills, this hand operated machine has a capacity for grinding face mills 4 to 24 in. diam, either high speed or tungsten-carbide. A heavy fabricated base and column supports the grinding wheel mechanism. A base table is equipped with hardened tracks operating on steel balls to permit easy setup. Grinding wheel spindle tilts either side of center up to 90° and locks in position while grinding. A cross carriage is provided to give cross movement to the grinding spindle 5 in. either side of center. Work spindle may be revolved 360°. Design centers the cutter directly over the supporting ways. A diamond dresser permits the wheel to be dressed as it wears down and maintains a fixed grinding position. *Oliver Instrument Co.*

For more data circle No. 56 on postcard, p. 153.

Production machine

Carburetor air horns are machined at the rate of 375 per hour by a new high speed production machine. It drills, burrs, reams, taps and spotfaces, performing 24 operations on 21 holes on 4 perpendicular and one angular face. The machine may be adapted easily for almost any type of product requiring multiple drilling operations on a mass production basis. Unit type construction permits fast, easy realignment of the machine for product model changes, for completely new models, or for other type products. Basic unit is a stationary

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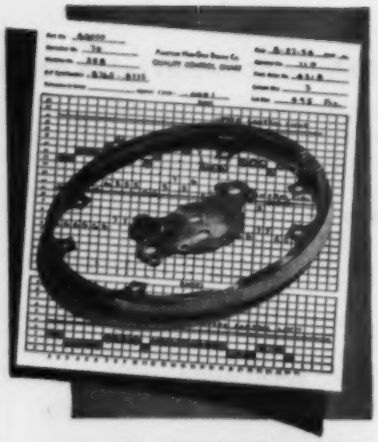

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Lansing Stamping Co.
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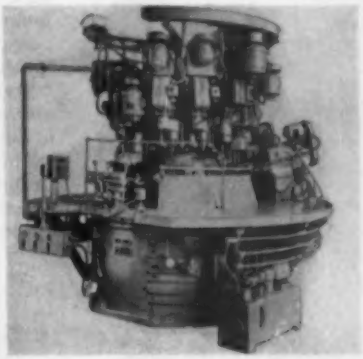
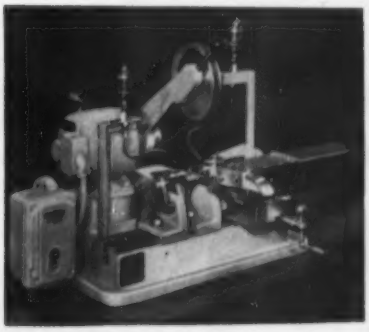


vertical center column, surrounded by a horizontal removable plate. A hydraulically operated indexing table is mounted on the central column. Above the table, on the column, and plate, Morris Air-Oil-Matic drill units are mounted. *Morris Machine Tool Co.*

For more data circle No. 57 on postcard, p. 153.

Turning lathe

Designed for armatures of small fractional horsepower motors, Model 1AL turning lathe turns the commutator while the armature revolves on its own axis, assuring extreme accuracy, fine finish, with greater production. The armature mounts on two supports and is rotated on its own shaft by the friction drive of a revolving belt. By rotating on a parallel axis, the com-



mutator of the armature is turned to true concentricity. Depth and length of cut is performed automatically. Tolerances are held on duplicate work to 0.0005 in. Smooth finish is obtained by rotating at speeds up to 7000 rpm. Diamond or carbide-tipped tools are used. *Rivett Lathe & Grinder, Inc.*

For more data circle No. 58 on postcard, p. 153.

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ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

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Digest of the Week in Metalworking

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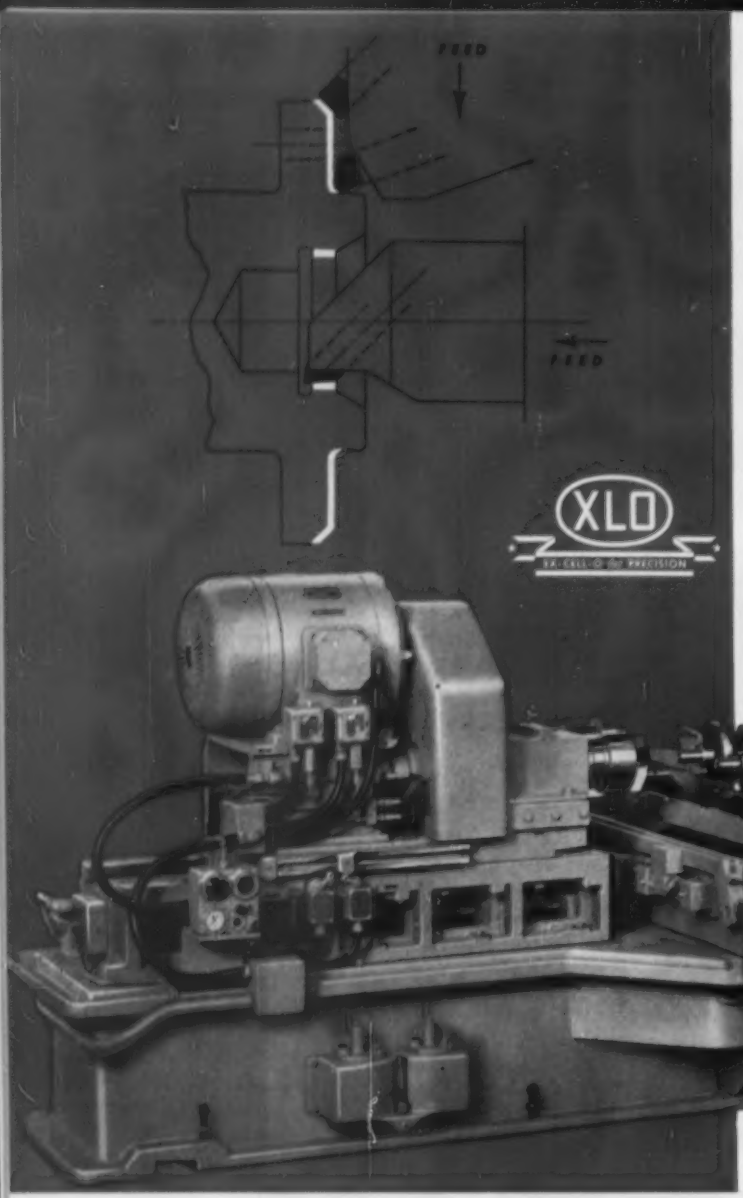

On this Ex-Cell-O special Machine two standard, hydraulically operated slides are mounted on a base with a transfer type fixture between them. The left slide, which supports the spindles, advances, and hydraulically operated chucks grip and rotate the parts. Then the right slide carrying the tools advances. Crankshaft operations include precision boring a diameter within limits of ±.0005", holding the bore concentric with main bearings, facing a surface square with main bearings, and chamfering an edge. Surface cuts are indicated in white in diagram at left.

EX-CELL-O Special Machine Bores, Faces 2 Crankshafts SIMULTANEOUSLY

What an improvement!

Automation equipment picks up *two* automotive crankshafts, places them in machining position, bores, faces and chamfers the flange ends simultaneously, and transfers them to the unloading position *all in one automatic cycle.*

Building special purpose machines is an Ex-Cell-O forte. Manufacturers with problems in accuracy, production, and in combining numerous operations, look to Ex-Cell-O.

In return for this confidence Ex-Cell-O builds them special machines which quickly pay for themselves through substantial production increases, improved quality, and reduced unit costs.

Whatever your plans for greater, more economical production, they can be materialized at Ex-Cell-O. Your Ex-Cell-O representative will be happy to discuss them with you.

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AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

55-38

The Iron Age SUMMARY . . .

Mills push all-out effort to balance production with demand . . . Busy period ahead will be tough . . . Carryovers into 1956 will be heavy.

Watch Sparks Fly . . . Steel producers are making an all-out effort to close the gap between production and demand. But they're still running 10 to 20 pct behind. As a result, backlogs continue to grow and heavy carryovers into 1956 are expected.

The drive to bring deliveries into line with promises is two-pronged: (1) Top-speed production, and (2) drastic slashes in allotments. The period from now until end of the year will be tough on everybody.

Producers finally have something working in their favor. Maintenance is still a problem, but the mills are catching up. Hot weather and vacations are behind them. Some mills already are on an above-capacity operating basis.

Busy Period Ahead . . . Steel output and orders are expected to top any previous period in the last four months of this year. It will be one of the busiest and toughest periods the industry and its customers have ever had to contend with. Here's why:

(1) There will be no letup in demand from any of the major consuming industries, (2) automotive, particularly, will be scrambling for every pound of steel it can lay hands on, (3) inventory-building will be a strong factor, and (4) the logjam of backlogs still has to be broken.

Meanwhile, customer relations in steel are getting worse. The purchasing agent of a Midwestern manufacturer is openly resentful at drastic cuts in his allotment of hot rolled sheets, one of the tightest items on the list. The cuts will force him to warehouse buying if other mills don't come to his rescue.

Freight Crisis Looms . . . The warehouses themselves are in a bad way on critical products. They're up against a combination of heavy orders and delayed deliveries from the mills. Plates and structurals are especially critical at the warehouse level.

The situation in plates has reached the point where the railroads' ambitious carbuilding program is in such dire straits that the country is faced with a freight car crisis this fall and winter. (See page 97.)

A recent major oil refinery fire has compounded the problem in plates and structurals, another critical item made more critical by emergency flood requirements. Estimates are that more than 10,000 tons of plates alone will be required to repair storage tanks.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,316	2,264	2,176	1,583
Ingot Index				
(1947—1949=100)	144.0	140.9	135.5	98.5
Operating Rates				
Chicago	97.5	97.0*	95.0	68.5
Pittsburgh	97.0	94.0*	95.0*	67.0*
Philadelphia	98.0	96.0*	87.0*	58.0
Valley	96.0	96.0	92.0*	57.0
West	91.5	92.7*	96.5*	84.0*
Detroit	90.0	86.0	89.0*	84.0
Buffalo	105.0	100.0	100.0	56.5
Cleveland	99.0	95.7*	98.0*	75.0
Birmingham	96.0	92.0	70.0(Est.)	75.0
So. Ohio River	89.5	86.4*	90.5*	79.0
Wheeling	100.0	97.0	99.0	93.0
St. Louis	106.0	102.0	96.0	69.0
Northeast	96.0	95.0	93.5	46.0*
Aggregate	96.0	93.0	93.0	68.5*

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.174	5.174	5.174	4.801
Pig Iron (Gross ton)	$59.05	$59.09	$59.09	$56.59
Scrap, No. 1 hvy (gross ton)	$44.17	$43.83	$43.83	$29.50
Nonferrous				
Aluminum, ingot	23.20	23.20	23.20	22.20
Copper, electrolytic	43.00	43.00	36.00	30.00
Lead, St. Louis	14.80	14.80	14.80	14.30
Magnesium, ingot	29.25	29.25	29.25	27.75
Nickel, electrolytic	67.67	67.67	67.67	63.08
Tin, Straits, N. Y.	96.75	95.375	96.50	93.75
Zinc, E. St. Louis	12.50	12.50	12.50	11.50

Plates Are Getting Worse

Plate market is tough, but it will get tougher . . . Record crops are bolstering tin plate demand . . . Inventory status of warehouses is worsening . . . Backlogs growing.

◆ WATCH out for a further tightening in plates, particularly light gauge plates. Everybody's getting into the act — railroads, machine tools, construction, among others.

Another product to watch is tin plate. The can companies theoretically went into the harvest season with adequate inventories. But record crops are knocking their estimates into the ash can. Consequently, they're still pressing for delivery from the mills. A Mid-western source reports a rapidly-developing shortage of tin plate in the area. Heavy tonnages are being shipped from other producing centers to make up the deficit.

Plates are becoming almost hopeless. The shortage is hamstringing the railroads in their ambitious car-building program (see page 97), and one problem after another is arising in other industries. The big fire at the Whiting, Ind., refinery of Standard Oil Co., superimposes emergency demands for repair and replacement. The floods in the Northeast will require tonnages of plate for the same reasons.

The inventory position of warehouses is rapidly deteriorating. Hot and cold rolled sheets, plates, and structurals, are particularly tight at the warehouse level and there's little chance of improvement. Warehouse position on light gauge plates is described as "critical." Mill deliveries to warehouses are lagging just as they are to other industries.

SHEETS AND STRIP . . . Continuing strong demand for tin plate and galvanized is straining sheet facilities to the limit and contributing to the buildup of hot and cold rolled backlogs. Tin plate demand is especially strong in Midwest, where a shortage appears to be developing. **Chicago** reports hot and cr sheets definitely will be carry-over items into '56. **Detroit** consumers are clamoring to place first quarter business but mills are holding off. In **Pittsburgh**, hot rolled users are just now receiving orders originally scheduled for June delivery. **Cleveland** producers are bracing for a tremendous pickup in sheets.

BARS . . . **Pittsburgh** producers have the bar capacity to meet demand but they're plagued by a shortage of raw steel due to the drain of competing products; as a result, backlogs and deliveries continue to lengthen. **Detroit** finds one producer accepting limited orders of cold rolled alloy bar for first quarter delivery. Deliveries on alloy hot and cold rolled bars are as much as four weeks behind in **Chicago.** Situation just as tight in **Cleveland.**

PLATE . . . A steady buildup in demand and backlogs in the **Chicago** area; light gauge plates are critical. A carryover into February already foreseen by **Pittsburgh** producers. Extremely tight market is paralelled in **Detroit** and **Cleveland.**

STRUCTURALS . . . Uncertainty of flood emergency requirements and continued strong demand from construction and other industries is keeping market in a turmoil. **Chicago** reports deliveries are running 2-to-4 weeks behind promises; a carryover of 1-4 weeks into '56 freely predicted. Delivery status everywhere is muddled.

TUBULAR PRODUCTS . . . Strong demand for linepipe and oil country goods guaranteeing a good market into 1956. Linepipe producers in **Chicago** have adopted a cautious attitude toward accepting new business. New records for oil well drillings maintaining pressure on oil country goods. Construction activity sustaining buttweld demand.

WIRE PRODUCTS . . . **Chicago** reports manufacturers wire is booked through January; reinforcing fabric running 3-4 months behind delivery promises; spring wire and heading wire demand strong and still bolstered by automotive, farm equipment, and road machinery manufacturers. **Pittsburgh** finds merchant wire market picking up, but not substantially. Heavy construction schedules are pushing nail deliveries farther behind—4 to 5 weeks.

WAREHOUSE . . . Inventories are declining while new business is building up. The warehouses find themselves in the unhappy position of having plenty of business but uncertain as to when they will get deliveries from the mills. Structurals and plate are on the critical list. The situation is expected to grow even tighter in the months ahead. One large warehouse chain looks for a record business month to shape up in October. Current demand is exceeding shipments from mills. In some cases, unshipped tonnages from producers is running in excess of current month's allotments. There's talk in **Chicago** area that mills may drop part of November in an effort to catch up on backlogs.

Purchasing Agent's Checklist:

MACHINE TOOLS: Show stimulates interest ..... p. 91

COPPER: Latin American politics affects price ..... p. 95

TRANSPORTATION: Freight car shortage looms ..... p. 97

STEEL: Production records are in sight for year's end ..... p. 187

Comparison of Prices

(Effective Sept. 13, 1955)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Sept. 13 1955	Sept. 6 1955	Aug. 16 1955	Sept. 14 1954
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.325¢	4.325¢	4.325¢	4.05¢
Cold-rolled sheets	5.325	5.325	5.325	4.95
Galvanized sheets (10 ga.)	5.85	5.85	5.85	5.45
Hot-rolled strip	4.325	4.325	4.325	4.05
Cold-rolled strip	6.29	6.29	6.29	5.82
Plate	4.52	4.52	4.52	4.237
Plates wrought iron	9.30	9.30	9.30	9.30
Stainl'a C-R strip (No. 302)	44.50	44.50	44.50	41.50
Tin and Ternplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.05	$9.05	$9.05	$8.95
Tinplate, electro (0.50 lb.)	7.75	7.75	7.75	7.65
Special coated mfg. terne	7.85	7.85	7.85	7.75
Bars and Shapes: (per pound)				
Merchant bars	4.65¢	4.65¢	4.65¢	4.312¢
Cold-finished bars	5.90	5.90	5.90	5.40
Alloy bars	5.65	5.65	5.65	5.075
Structural shapes	4.60	4.60	4.60	4.25
Stainless bars (No. 302)	38.25	38.25	38.25	35.50
Wrought iron bars	10.40	10.40	10.40	10.40
Wire: (per pound)				
Bright wire	6.25¢	6.25¢	6.25¢	5.75¢
Rails: (per 100 lb.)				
Heavy rails	$4.725	$4.725	$4.725	$4.45
Light rails	5.65	5.65	5.65	5.35
Semifinish Steel: (per net ton)				
Rerolling billets	$68.50	$68.50	$68.50	$64.00
Slabs, rerolling	68.50	68.50	68.50	64.00
Forging billets	84.50	84.50	84.50	78.00
Alloy blooms, billets, slabs	96.00	96.00	96.00	86.00
Wire Rod and Skelp. (per pound)				
Wire rods	5.025¢	5.025¢	5.025¢	4.675¢
Skelp	4.225	4.225	4.225	3.90
Finished Steel Composite: (per pound)				
Base price	5.174¢	5.174¢	5.174¢	4.801¢

	Sept. 13 1955	Sept. 6 1955	Aug. 16 1955	Sept. 14 1954
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$63.69	$63.69	$63.69	$61.19
Foundry, Valley	59.00	59.00	59.00	56.50
Foundry, Southern, Cin'ti	62.93	62.93	62.93	60.43
Foundry, Birmingham	55.00	55.00	55.00	52.55
Foundry, Chicago	59.00	59.00	59.00	56.50
Basic, del'd Philadelphia	62.77	62.77	62.77	60.27
Basic, Valley furnace	58.50	58.50	58.50	56.00
Malleable, Chicago	59.00	59.00	59.00	56.50
Malleable, Valley	59.00	59.00	59.00	56.50
Ferromanganese‡, cents per lb.	9.50¢	9.50¢	9.50¢	9.50¢

‡ 74-76 pct Mn base.

Pig Iron Composite: (per gross ton)				
Pig iron	$59.09	$59.09	$59.09	$56.59
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$44.50	$44.50	$44.50	$30.50
No. 1 steel, Phila. area	46.50	46.50	46.50	28.50
No. 1 steel, Chicago	41.50	40.50	40.50	29.50
No. 1 bundles, Detroit	39.00	38.50	38.50	24.50
Low phos., Youngstown	47.50	47.50	46.50	32.50
No. 1 mach'y cast, Pittsburgh	46.50	46.50	44.50	42.50
No. 1 mach'y cast, Philadel'a	47.50	46.50	46.50	40.50
No. 1 mach'y cast, Chicago	52.50	52.50	52.50	40.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$44.17	$43.83	$43.83	$29.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$13.25	$13.25	$13.25	$14.25
Foundry coke, prompt	16.25	16.25	16.25	16.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	43.00	43.00	36.00	30.00
Copper, Lake, Conn.	43.00	43.00	36.00	30.00
Tin, Straits, New York	96.75†	95.375	96.50	93.75
Zinc, East St. Louis	12.50	12.50	12.50	11.50
Lead, St. Louis	14.80	14.80	14.80	14.30
Aluminum, virgin ingot	23.20	23.20	23.20	23.20
Nickel, electrolytic	67.67	67.67	67.67	65.08
Magnesium, ingot	29.25	29.25	29.25	27.75
Antimony, Laredo, Tex.	33.50	33.50	33.50	33.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b. subject to switching charges.

←To identify producers, see Key on P. 200→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Bethlehem *B3*	60.50	61.00	61.50	62.00	.....
Birdsboro, Pa. *B6*	60.50	61.00	61.50	62.00	.....
Birmingham *R3*	54.50	55.00	.....	.....	.....
Birmingham *W9*	54.50	55.00	59.00	.....	.....
Birmingham *U4*	54.50	55.00	59.00	.....	.....
Buffalo *R3*	58.50	59.00	59.50	.....	.....
Buffalo *H1*	58.50	59.00	59.50	.....	.....
Buffalo *W6*	58.50	59.00	59.50	60.00	.....
Chester *C17*	54.50	55.00	55.50	.....	.....
Chicago *I4*	58.50	59.00	59.00	59.50	.....
Cleveland *A5*	58.50	59.00	59.00	59.50	63.50
Cleveland *R3*	58.50	59.00	59.00	.....	.....
Daingerfield *L3*	55.00	55.00	55.00	.....	.....
Duluth *I4*	58.50	59.00	59.00	59.50	.....
Erie *I4*	58.50	59.00	59.00	59.50	.....
Everett *M6*	.....	61.00	61.50	.....	.....
Fontana *K1*	64.50	65.00	.....	.....	.....
Geneva, Utah *C7*	58.50	59.00	.....	.....	.....
Granite City *G2*	60.40	60.90	61.40	.....	.....
Hubbard *Y1*	.....	.....	59.00	.....	.....
Lone Star *L3*	.....	55.00	.....	.....	.....
Minnequa *C6*	60.50	61.00	61.50	.....	.....
Monessen *P6*	58.50	.....	.....	.....	.....
Neville Is. *P4*	58.50	59.00	59.00	.....	.....
N. Tonawanda *T1*	.....	59.00	59.50	.....	.....
Pittsburgh *U1*	58.50	.....	.....	59.50	.....
Sharpsville *S3*	58.50	59.00	59.00	59.50	.....
So. Chicago *R3*	58.50	.....	59.00	.....	.....
Steelton *B3*	60.50	61.00	61.50	62.00	66.50
Swedeland *A2*	60.50	61.00	61.50	62.00	.....
Toledo *I4*	58.50	59.00	59.00	59.50	.....
Troy, N. Y. *R3*	60.50	61.00	61.50	62.00	66.50
Youngstown *Y1*	.....	.....	59.00	59.50	.....

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional, 0.25 pct nickel.

Silvery iron: Buffalo, *H1*, $68.75; Jackson, *J1*, *G1*, $67.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	301	302	303	304	316	321	347	410	416	430
Ingots, rerolling	17.75	19.00	—	20.25	31.00	25.00	33.75	15.00	—	18.25
Slabs, billets, rerolling	22.25	24.75	26.75	26.00	40.25	32.00	43.00	19.50	—	19.75
Forg. discs, die blocks, rings	—	—	—	—	—	—	—	—	—	—
Billets, forging	31.75	32.00	34.75	33.75	51.25	38.25	51.00	25.50	26.00	26.00
Bars, wires, structurals	38.00	38.25	41.00	40.25	60.75	45.25	60.00	30.50	31.00	31.00
Plates	40.00	40.25	42.75	43.00	64.00	49.25	64.75	31.75	33.00	32.25
Sheets	44.25	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75
Strip, hot-rolled	32.00	34.50	—	37.25	58.25	44.25	59.75	—	—	—
Strip, cold-rolled	41.00	44.50	—	47.25	68.25	54.25	73.50	36.25	—	36.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; McKeesport, Pa., *U1*; Washington, Pa., *W1*, *J3*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I3*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W1*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Middletown, O., *A7*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (.25¢ per lb higher); *W1* (.25¢ per lb higher); New Bedford, Mass., *R6*.

Bar: Baltimore, *A7*; Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U7*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T3*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R5*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*.

Plates: Brackenridge Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I3*; Middletown, *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C13*; Philadelphia, *D5*.

Forged discs, die blocks, rings: Pittsburgh, *C11*; Syracuse, *C11*; Farndale, Mich., *A3*; Washington, Pa., *J3*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J3*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*.; Detroit, *R5*

Market Shows Firmer Tone

No. 1 heavy melting moves up in Chicago . . . But lack of heavy buying still clouds picture . . . Only major new orders are for No. 2 bundles . . . Composite up.

◆ SCRAP market looked a little stronger this week. No. 1 heavy melting advanced $1 in Chicago. No. 2 bundles were moving on new orders in Pittsburgh and the East.

Birmingham reported general gains. The West Coast showed scattered increases.

But the market is still relatively quiet as far as new orders go. The mills are holding off new buying in the hope of lower prices. Brokers are determined not to part with scrap at anything less than going prices.

The result has been a stalemate that makes it difficult to obtain any clear picture of market condition. Something has got to give in the near future and with steel operating rates remaining high, this does not figure to be scrap prices.

The Iron Age Composite for No. 1 heavy melting steel scrap advanced 34¢ to $44.17.

Scrap exports in the fourth quarter will probably continue on the cargo-for-cargo basis now in effect. Some top Commerce Dept. officials think the flow of scrap overseas should be checked but the Administration's foreign policy planners have posted hands-off warnings.

Pittsburgh . . . A large consumer purchased a tonnage of No. 2 bundles at $37, but the general openhearth scrap picture was still foggy. It appears to be a cat and mouse situation with the mills resisting the current prices and the brokers unwilling or unable to sell at lower figures. Most of the tonnage involved in the above sale was on the long side of the market, and reports indicate that little additional broker buying was necessary to fill the order. Broker buying prices for mills just outside the area reportedly jumped after the sale with $37 offered for No. 2 bundles in tonnage lots. The day before the price had been $35. Railroad scrap prices are holding. Blast furnace grades are unchanged and latest sales confirm cast prices.

Philadelphia . . . Cast grades jumped sharply upwards as big foundries found they had to pay substantially more for good grades. In related sales, rails also made gains. Primary openhearth grades continued strong with medium and small purchases made at quoted prices. Mills are staying away from making big purchases, but slumping inventories and continued high operating rates are expected to force major buys in a short time.

Chicago . . . The firm undertone of the Chicago market is reflected in the $1 advance in the price of No. 1 heavy melting to a topside level of $42. No. 2 heavy melting is holding for the moment at previous levels with a stronger price level in this grade expected to materialize shortly. Broker strength continues to hold firm in the blast furnace grades with most prices holding at earlier quotations. Railroad specialties are reflecting some strength as is the cast market, which has been firm all along. No heavy mill purchases of top steelmaking grades have come about.

New York . . . New buying continues to lag as a big domestic consumer limited new order to No. 2 bundles at going prices. The mills have yet to come in for heavy tonnage and there has been talk of a softer tone to the market, but no one has been able to buy scrap at lower prices. Foundry buying has strengthened cast grades, with mixed yard cast moving up $1.

Detroit . . . An outside mill bought No. 2 bundles last week on a $28 fob basis. Meanwhile, the market is maintaining its present high level despite the absence of local activity. One possible reason for the present strength is the rumor that a Canadian mill has placed an additional order for 50,000 tons of scrap to be delivered before the water shipping season ends.

Cleveland . . . Market continues unchanged, but undertone is very strong. There have been no new sales, but one is expected to develop shortly. Most encouraging aspect of the market is that no heavy tonnages of Detroit scrap are hanging over. A Valley consumer is expected to enter the market shortly.

Birmingham . . . The scrap market in this district advanced in nearly all categories this week, openhearth grades leading the parade with a jump of $4 per ton when leading consumers re-entered the market for limited tonnages. Dealers say this advance was long overdue in view of prices in other markets, which advanced 2 or 3 months ago.

St. Louis . . . The steel operating rate increased sharply nearly 22 pct to 106.1 pct. Movement of scrap buying to the district has improved as cooler weather permitted better handling of material in the field and in the yards. The volume of receipts is about equal to the melt. A RR list of 30 cars of No. 1 heavy melting brought a $1 advance, and turnings are up $2.

Cincinnati . . . A recent purchase by a leading consumer moved price of open hearth grades up $1.50 per ton this week. This contradicted an earlier purchase which seemed to weaken the market.

Buffalo . . . Market is firm and the trade looks for a new purchase in the near future. Prices are unchanged. Continued high-level mill production indicates that current strong market will hold for some time.

Boston . . . Prices are unchanged in a steady market here. No new buying is reported. Brokers look for a pickup in a week or two.

West Coast . . . Seattle prices went up on top grades, following previous week's pattern in San Francisco and Los Angeles. Increase in all three markets closed gap between mill and export prices. Los Angeles and San Francisco report activity in turnings as exporters buy heavily to fill up cargoes.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Berman

Scrap Prices *(Effective Sept. 13, 1955)*

Pittsburgh

No. 1 hvy. melting	$44.00 to $45.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	44.00 to 45.00
No. 2 bundles	36.00 to 37.00
Machine shop turn.	29.00 to 30.00
Mixed bor. and ms. turns.	29.00 to 30.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. punch'gs, plate	48.00 to 49.00
Heavy turnings	42.00 to 43.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	50.50 to 51.50
Rails 2 ft and under	54.00 to 55.00
RR. steel wheels	51.50 to 52.50
RR. spring steel	51.50 to 52.50
RR. couplers and knuckles	51.50 to 52.50
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	41.00 to 42.00
Heavy breakable cast.	36.00 to 37.00

Chicago

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 factory bundles	44.00 to 45.00
No. 1 dealers' bundles	41.00 to 42.00
No. 2 dealers' bundles	31.00 to 32.00
Machine shop turn.	28.00 to 29.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. forge crops	49.00 to 50.00
Low phos. punch'gs, plate	47.00 to 48.00
Low phos. 2 ft and under	45.00 to 46.00
No. 1 RR. hvy. melting	47.00 to 48.00
Scrap rails, random lgth.	52.00 to 53.00
Rerolling rails	65.00 to 66.00
Rails 2 ft and under	58.00 to 60.00
Locomotive tires, cut	48.00 to 49.00
Cut bolsters & side frames	49.00 to 51.00
Angles and splice bars	55.00 to 56.00
RR. steel car axles	54.00 to 55.00
RR. couplers and knuckles	50.00 to 51.00
No. 1 machinery cast.	52.00 to 53.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	39.00 to 40.00
Cast iron brake shoes	38.00 to 39.00
Cast iron car wheels	45.00 to 46.00
Malleable	53.00 to 54.00
Stove plate	39.00 to 40.00

Philadelphia Area

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	38.00 to 39.00
Machine shop turn.	27.50 to 28.50
Mixed bor. short turn.	27.50 to 28.50
Cast iron borings	27.50 to 28.50
Shoveling turnings	30.00 to 31.00
Clean cast chem. borings	27.00 to 28.00
Low phos. 5 ft and under	48.00 to 49.00
Low phos. 2 ft and under	49.00 to 50.00
Low phos. punch'gs	49.00 to 50.00
Elec. furnace bundles	47.00 to 48.00
Heavy turnings	42.00 to 43.00
RR. steel wheels	49.00 to 50.00
RR. spring steel	49.00 to 50.00
Rails 18 in. and under	57.00 to 58.00
Cupola cast	38.00 to 40.00
Heavy breakable cast.	45.00 to 46.00
Cast iron car wheels	51.00 to 52.00
Malleable	53.00 to 54.00
Unstripped motor blocks	29.00 to 31.00
No. 1 machinery cast	47.00 to 48.00

Cleveland

No. 1 hvy. melting	$43.50 to $44.50
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	43.50 to 44.50
No. 2 bundles	35.00 to 36.00
No. 1 busheling	43.50 to 44.50
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Cut struct'r'l & plates, 2 ft & under	48.00 to 49.00
Drop forge flashings	43.00 to 44.00
Low phos. punch'gs, plate	44.00 to 45.00
Foundry steel, 2 ft & under	47.00 to 48.00
No. 1 RR. heavy melting	47.00 to 48.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Railroad grate bars	36.00 to 37.00
Steel axle turnings	29.00 to 30.00
Railroad cast.	49.00 to 50.00
No. 1 machinery cast.	49.00 to 50.00
Stove plate	45.00 to 46.00
Malleable	51.00 to 52.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	$46.00 to $47.00
No. 2 hvy. melting	41.00 to 42.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	39.00 to 40.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	47.00 to 48.00

Buffalo

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 busheling	39.00 to 40.00
No. 1 bundles	39.00 to 40.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	30.00 to 31.00
Cast iron borings	29.00 to 30.00
Low phos. plate	45.00 to 46.00
Scrap rails, random lgth.	47.00 to 48.00
Rails 2 ft and under	52.00 to 53.00
RR. steel wheels	48.00 to 49.00
RR. spring steel	48.00 to 49.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	40.00 to 41.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	31.00 to 32.00
No. 1 bundles, openhearth	38.50 to 39.50
No. 2 bundles	27.00 to 28.00
New busheling	38.50 to 39.50
Drop forge flashings	38.00 to 39.00
Machine shop turn.	21.00 to 22.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	24.00 to 25.00
Low phos. punch'gs, plate	38.50 to 39.50
No. 1 cupola cast	40.00 to 41.00
Heavy breakable cast.	34.00 to 35.00
Stove plate	35.00 to 36.00
Automotive cast.	43.00 to 44.00

St. Louis

No. 1 hvy. melting	$36.50 to $37.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	36.50 to 37.50
No. 2 bundles	29.50 to 30.50
Machine shop turn.	25.00 to 26.00
Cast iron borings	27.00 to 28.00
Shoveling turnings	27.00 to 28.00
No. 1 RR. hvy. melting	45.00 to 46.00
Rails, random lengths	47.00 to 48.00
Rails, 18 in. and under	52.00 to 53.00
Locomotive tires uncut	48.00 to 49.00
Angles and splice bars	48.00 to 49.00
Std. steel car axles	48.00 to 49.00
RR. specialties	48.00 to 49.00
Cupola cast.	46.00 to 47.00
Heavy breakable cast.	35.00 to 36.00
Cast iron brake shoes	27.00 to 28.00
Stove plate	28.00 to 29.00
Cast iron car wheels	46.00 to 47.00
Malleable	42.50 to 43.50
Unstripped motor blocks	38.50 to 39.50

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	28.00 to 29.00
No. 1 bundles	35.00 to 36.00
No. 2 bundles	25.50 to 26.50
No. 1 busheling	35.00 to 36.00
Elec. furnace, 2 ft & under	36.00 to 37.00
Machine shop turn.	17.50 to 18.50
Mixed bor. and short turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Clean cast chem. borings	18.00 to 19.00
No. 1 machinery cast.	31.00 to 32.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	28.00 to 29.00
Unstripped motor blocks	17.00 to 18.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$40.50 to $41.50
No. 2 hvy. melting	25.00 to 26.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	18.00 to 19.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Clean cast chem. borings	24.00 to 25.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	33.00 to 34.00
Charging box cast.	37.00 to 38.00
Heavy breakable cast.	37.00 to 38.00
Unstripped motor blocks	24.00 to 25.00

Birmingham

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 bundles	36.00 to 37.00
No. 2 bundles	28.00 to 29.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	23.00 to 24.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	17.00 to 18.00
Electric furnace bundles	37.00 to 38.00
Bar crops and plate	42.00 to 43.00
Structural and plate, 2 ft	41.00 to 42.00
No. 1 RR. hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	49.00 to 50.00
Rails, 18 in. and under	53.00 to 54.00
Angles & splice bars	50.00 to 51.00
Rerolling rails	53.00 to 54.00
No. 1 cupola cast.	47.50 to 48.50
Stove plate	44.50 to 45.50
Charging box cast.	28.00 to 29.00
Cast iron car wheels	38.00 to 39.00
Unstripped motor blocks	36.00 to 37.00
Mashed tin cans	15.00 to 16.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$40.50 to $41.50
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	40.50 to 41.50
No. 2 bundles	32.00 to 33.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	23.00 to 24.00
Low phos., 18 in. & under	44.00 to 45.00
Rails, random lengths	49.00 to 50.00
Rails, 18 in. and under	57.00 to 58.00
No. 1 cupola cast.	44.00 to 45.00
Hvy. breakable cast.	38.00 to 39.00
Drop broken cast.	49.00 to 50.00

San Francisco

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	32.00
No. 1 bundles	34.00
No. 2 bundles	29.00
No. 3 bundles	25.00
Machine shop turn.	12.00
Cast iron borings	11.00
No. 1 RR. hvy. melting	34.00
No. 1 cupola cast.	42.00

Los Angeles

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	31.00
No. 1 bundles	33.00
No. 2 bundles	28.00
No. 3 bundles	24.00
Machine shop turn.	12.00
Shoveling turnings	16.00
Cast iron borings	12.00
Elec. furn. 1 ft and under	33.00
No. 1 RR. hvy. melting	33.00
No. 1 cupola cast.	42.00

Seattle

No. 1 hvy. melting	$35.50
No. 2 hvy. melting	21.50
No. 2 bundles	25.50
No. 3 bundles	21.50
No. 1 cupola cast.	35.00
Mixed yard cast.	35.00

Hamilton, Ont.

No. 1 hvy. melting	$38.50
No. 2 hvy. melting	35.50
No. 1 bundles	38.50
No. 2 bundles	32.50
Mixed steel scrap	32.50
Bushelings	33.50
Bush., new fact. prep'd	36.50
Bush., new fact. unprep'd	32.50
Machine shop turn.	16.00
Short steel turn.	25.50
Mixed bor. and turn.	$16.00 to 17.00
Rails, rerolling	47.50
Cast scrap	42.00 to 45.00

cast iron wheels

for railroad wagons

Slightly more than two centuries ago, cast iron wheels were introduced for railroad wagon use. At first, only the forward axles were so equipped, in the belief that brakes would not hold on iron. But this theory was soon disproved—and cast iron was adopted for both rear and front wheels.

Now, on the country's rails and highways, wheels of iron or steel transport a vast tonnage of industrial and agricultural products—the vital needs for civilian and military use. To meet the ever-increasing demand for wheels, the supply of scrap must be constantly maintained.

For the purchase or sale of iron or steel scrap . . .

phone or write "Your Chicago Broker"

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231 S. La Salle St., Chicago

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Push on Aluminum Wire

Aluminum producers set to push electrical wire . . . Double increase in copper price top sales tool . . . Order books expected to reflect trend in 1956.

◆ ALUMINUM producers are trying to use the latest double boost in the price of copper as a wedge to further open the door marked "electrical wire and cable consumers." And from all indications they will be successful. This is not a new campaign by any means. It first started during the Korean War.

Copper became tight, so the government suggested the use of aluminum as a substitue when necessary and made appropriate allocations.

The technical advantage of either metal depends on where you stand. By quantity, copper is a better conductor. By weight aluminum is a better conductor, even in the cases where it is steel reinforced.

According to the aluminum companies, supported by a number of the major utilities, the advantage of economics belongs to aluminum. Declared the purchasing agent of one large electrical power producer: "The higher the copper price goes the more economical aluminum becomes." He also reports a savings since 1951 of 40 pct on purchase of aluminum instead of copper transmission wire.

Despite this claimed cost advantage, aluminum inroads have been relatively slow, more in the manner of a trend than a landslide. However, current market conditions are making the copper cable consumers take a good second look.

Both copper and aluminum are tight, but the outlook seems just a little better for aluminum as far as stability of production is concerned.

Aluminum producers, for the most part, run their entire operation, from bauxite to primary product, including shipping. They are basically uncontrolled except by their economic status and the law of supply and demand.

The copper producers, on the other hand, are finding their supply of ore in this country dwindling to the point where they must depend more on their foreign holdings. These holdings are adequate. But they are subject to the control of the foreign government and the ups and downs of the foreign economy.

Of increasing importance in planning production schedules is the labor factor, and based on nothing more than past history, the aluminum companies have a wide edge. The copper producers have not been nearly as lucky. This year and last, considerable production time was lost in both domestic and Chilean holdings due to labor difficulties.

Marketing executives recognize the fact that this is a boom year for business and they want their full share. They can do this most efficiently by stepped up steady production. Generally, they will use the raw materials they can get, at the best price, to produce the best product.

Order books in first quarter of 1956 will show that more wire fabricators are deciding that aluminum is the answer to their problem.

It is entirely possible that this impending loss of a certain amount of business may do the copper companies some good. They can still sell every pound of copper they can mine. The slackening of demand, no matter to what degree, may serve to take some of the pressure off and help stabilize the market.

TITANIUM . . . The Government has called a complete halt to fast amortization in the titanium industry. Last month, the office of Defense Mobilization said it would approve no more fast write-offs for additional capacity in titanium. Monday of this week, ODM said it would approve no more fast write-offs for new melting or processing facilities.

ODM estimates titanium production this year at 8000 tons, says it probably will total 22,500 tons by 1957. The agency says titanium is now abundant enough to meet all military and commercial demand, and rapid amortization is no longer necessary. ODM will keep an eye on the industry, however, and will be ready to lend a hand if anticipated expansion should hit a snag.

ZINC . . . The price of prime western zinc at East St. Louis rose ½¢ to 13¢ per lb early this month. For some reason, the boost seemed to catch the market more or less by surprise. Several of the shrewder consumers must have been expecting the move. Immediately preceding the increase there was a flurry of buying.

Actually the market has been firm for some time. There certainly was room for the boost without basically affecting demand. Added to this the fact that zinc has been aiming for this price since it hit the toboggan to 9.25¢ in January 1953, it becomes almost obvious that such a move was in the offing.

MERCURY . . . A tight supply situation caused by the latest strike by longshoremen on the New York waterfront caused the price of mercury to jump about $2 to as high as $259 per flask of 76 lb. However, it is expected that this firmer market will loosen up a bit as soon as the strike is permanently settled.

Daily Nonferrous Metal Prices

(Cents per lb except as noted)

	Sept. 7	Sept. 8	Sept. 9	Sept. 10	Sept. 12	Sept. 13
Copper, electro, Conn.	43.00	43.00	43.00	....	43.00	43.00
Copper, Lake, delivered	43.00	43.00	43.00	....	43.00	43.00
Tin, Straits, New York	95.25	96.00	96.25	96.375	96.625	96.75*
Zinc, East St. Louis	13.00	13.00	13.00	13.00	13.00	13.00
Lead, St. Louis	14.80	14.80	14.80	14.80	14.80	14.80

Note: Quotations are going prices *Tentative

...naturally it's

AMERICAN MONORAIL

This American MonoRail Monotractor unit, recently installed in a rug and carpet warehouse, dispatches hard to handle, big bulky loads over a wide area. Fully automatic, with finger-tip control, with a hoist capacity of 1,000 pounds, this installation is SAVING 200 MAN HOURS PER WEEK.

This is another of the many examples of American MonoRail engineering for low-cost, efficient overhead handling. Let your American MonoRail representative explain the versatility, low cost and low maintenance of American MonoRail equipment. Consultation in connection with any handling problem is available without obligation.

For Continuous Flow of Light Loads Use Landahl Chainless Conveyors

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MONORAIL COMPANY

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[IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.]

Nonferrous Prices *(Effective Sept. 18, 1955)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Alloy	Flat Sheet			Plate
	0.032 in.	0.081 in.	0.136-0.249 in.	0.250-3.000 in.
1100, 3003	40.8	38.7	37.5	36.5
3004	45.7	41.4	39.7	39.1
5052	48.3	43.4	41.7	39.9
2024-O, -OAL	51.2	42.5	41.0	41.2
7075-O, -OAL	62.6	50.8	48.5	48.6

Magnesium

(F.o.b. mill, freight allowed)

Sheet & Plate: FS1-O ¼ in., 61¢; 3/16 in., 61¢; ⅛ in., 61¢; 0.064 in., 78¢; 0.032 in., 99¢. Specification grade higher. Base, 30,000 lb.

Extruded Round Rod: FS, diam ⅛ to 0.311 in., 82.5¢; ⅜ to ⅝ in., 65¢; 1¼ to 1.749 in., 60.5¢; 2½ to 5 in., 57¢. Other alloys higher. Base up to ⅝ diam, 10,000 lb; ¾ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes: Rectangles: FS. In weight per ft for perimeters less than size indicated: 0.10 to 0.11 lb, 3.5 in., 70.7¢; 0.22 to 0.25 lb, 5.9 in., 66.9¢; 0.50 to 0.59 lb, 8.6 in., 68¢; 1.8 to 2.50 lb, 19.5 in., 60.5¢; 4 to 6 lb, 23 in., 57.7¢. Other alloys higher. Base, in weight per ft of shape: Up to ⅛ lb, 10,000 lb; ⅛ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: FS, 0.049 to 0.057 in. wall thickness: OD ¼ to 5/16 in., $1.625; 5/16 to ⅜ in., $1.475; ½ to ⅝ in., $1.105; 1 to 2 in., 92.5¢; 0.165 to 0.219 in. wall: OD, ⅜ to ⅝ in., 75.5¢; 1 to 2 in., 71.5¢; 3 to 4 in., 70.5¢. Other alloys higher. Base OD: Up to 1½ in., 10,000 lb; 1½ to 3 in., 20,000 lb; over 3 in., 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $14.00-$14.50; alloy $16.50; Plate, HR, commercially pure, $11.50-$12.00; alloy, $12.50-$12.75; Wire, rolled and/or drawn, commercially pure, $10.50-$11.00; alloy, $12.50; Bar, HR or forged, commercially pure, $8.50-$8.75; alloy, $8.50-$9.00.

Nickel, Monel, Inconel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	102	78	99
Strip, CR	102	87	125
Rod, Bar, HR	87	69	93
Angles, HR	87	69	93
Plate, HR	97	82	95
Seamless Tube	123	108	153
Shot, Blocks		85	

Copper, Brass, Bronze

(Freight included on 500 lb)

	Sheet	Rods	Extruded Shapes
Copper	56.79		58.86
Copper, h-r	58.76	56.11	
Copper, drawn		56.36	
Low brass	53.16	53.09	
Yellow brass	49.27	49.21	
Red brass	54.54	54.48	
Naval brass	52.83	47.14	48.40
Leaded brass			45.74
Com. bronze	56.48	56.42	
Mang. bronze	56.57	50.67	52.23
Phos. bronze	77.14	77.64	
Munts metal	50.94	46.75	48.00
Ni silver, 10 pct	68.05	66.12	68.50

Beryllium copper, CR, 1.9% Be, Base 2000 lb, f.o.b.

Strip	$1.84
Rod, bar, wire	1.81

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	24.40
Aluminum pig	22.50
Antimony, American, Laredo, Tex.	33.50
Beryllium copper, per lb cont'd Be	$40.00
Beryllium aluminum 5% Be, Dollars per lb contained Be	$72.75
Bismuth, ton lots	$2.25
Cadmium, del'd	$1.70
Cobalt, 97-99% (per lb)	$2.60 to $2.67
Copper, electro, Conn. Valley	43.00
Copper, Lake, delivered	43.00
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.9%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$90 to $100
Lead, St. Louis	14.80
Lead, New York	15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb, pig	32.50
ingot	33.25
Magnesium, sticks, 100 to 500 lb	53.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$257 to $259
Nickel electro	64.50
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	60.75
Palladium, dollars per troy oz.	$22 to $24
Platinum, dollars per troy oz.	$90 to $94
Silver, New York, cents per troy oz.	90.75
Tin, New York	96.75
Titanium, sponge, grade A-1	$3.95
Zinc, East St. Louis	13.00
Zinc, New York	13.50
Zirconium, sponge	$7.50 to $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5-5 ingot	
No. 115	42.50
No. 120	42.00
No. 123	41.50
80-10-10 ingot	
No. 305	45.75
No. 315	44.00
88-10-2 ingot	
No. 210	59.25
No. 215	55.25
No. 245	48.75
Yellow ingot	
No. 405	34.75
Manganese bronze	
No. 421	38.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	31.25-32.50
0.60 copper max.	31.00-32.25
Piston alloys (No. 122 type)	31.00-32.00
No. 12 alum. (No. 2 grade)	30.00-30.75
108 alloy	30.00-30.50
195 alloy	31.25-32.25
13 alloy (0.60 copper max.)	31.50-32.25
AXS-679	30.00-30.50

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½%	30.50-31.50
Grade 2—92-95%	29.50-30.50
Grade 3—90-92%	28.50-29.50
Grade 4—85-90%	28.00-28.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 5000 lb lots)

Copper	
Cast, oval, 15 in. or longer	50.92
Electrodeposited	43.28
Brass, 80-20	
Cast, oval, 15 in. or longer	55.00
Zinc, flat cast	20.25
Ball, anodes	19.00
Nickel, 99 pct plus	
Cast	98.50
Cadmium	$1.70
Silver 999 fine, rolled, 100 oz. lots per troy oz., f.o.b. Bridgeport, Conn.	94½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	76.00
Copper sulphate, 99.5 crystals, bbl.	13.75
Nickel salts, single or double, 4-100 lb bags, frt. allowed	31.25
Nickel chloride, 300 to 400 lb.	43.50
Silver cyanide, 100 oz. lots, per oz.	81¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.80
Zinc cyanide, 100 lb drum	54.20

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	39	38¼
Yellow brass	28⅞	26⅝
Red brass	34¼	33⅛
Comm. bronze	35⅝	35
Mang. bronze	27	25½
Yellow brass rod ends	28⅝	

Custom Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	44
No. 2 copper wire	42½
Light copper	40½
*Refinery brass	38

* Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	44
No. 2 copper wire	42½
Light copper	40½
No. 1 composition	35
No. 1 comp. turnings	34½
Rolled brass	25⅛
Brass pipe	26
Radiators	27⅛
Aluminum	
Mixed old cast.	19½—20½
Mixed new clips	20½—21½
Mixed turnings, dry	19½—21

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	39 —40
No. 2 heavy copper and wire	38 —39
Light copper	35 —36
New type shell cuttings	36 —37
Auto radiators (unsweated)	24 —24½
No. 1 composition	30 —31
No. 1 composition turnings	29 —30
Unlined red car boxes	24 —24½
Cocks and faucets	24½—25
Mixed heavy yellow brass	22 —22½
Old rolled brass	23 —24
Brass pipe	25½—26
New soft brass clippings	25 —25½
No. 1 brass rod turnings	23 —23½

Aluminum

Alum. pistons and struts	16½—17
Aluminum crankcases	17 —17½
1100 (2S) aluminum clippings	19 —19½
Old sheet and utensils	16½—17
Borings and turnings	10½—11¼
Misc. cast aluminum	17 —17½
2024 (24s) clippings	18 —18½

Zinc

New zinc clippings	8 — 8½
Old zinc	5½— 6
Zinc routings	4
Old die cast scrap	3½

Nickel and Monel

Pure nickel clippings	92
Clean nickel turnings	75
Nickel anodes	92
Nickel rod ends	93
New Monel clippings	44½
Clean Monel turnings	34
Old sheet Monel	40
Nickel silver clippings, mixed	22
Nickel silver turnings, mixed	18

Lead

Soft scrap lead	11½—12
Battery plates (dry)	6½— 6⅝
Batteries, acid free	4¼

Magnesium

Segregated solids	12½—13
Castings	17½—18

Miscellaneous

Block tin	80
No. 1 pewter	64
Auto babbitt	42 —43
Mixed common babbitt	14½
Solder joints	17½—20
Siphon tops	43
Small foundry type	16½
Monotype	15
Lino. and stereotype	14 —14¼
Electrotype	12 —12½
Hand picked type shells	10¾
Lino. and stereo. dross	5½
Electro dross	5

IRON AGE

STEEL PRICES

(Effective Sept. 18, 1955)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$96.00 *B3*		4.65 *B3*	6.80 *B3*	4.65 *B3*						
	Buffalo, N. Y.	$68.50 *B3*	$84.50 *R3, B3*	$96.00 *R3, B3*	5.45 *B3*	4.65 *B3*	6.80 *B3*	4.65 *B3*	4.325 *R3,B3*	6.25 *B3* 6.25 *R7,S10*	6.425 *B3*	9.125 *B3*		
	Claymont, Del.													
	Harrison, N. J.													13.45 *C11*
	Conshohocken, Pa.								4.375 *A2*	6.30 *A2*	6.425 *A2*			
	New Bedford, Mass.									6.70 *R6*				
	Johnstown, Pa.	$68.50 *B3*	$84.50 *B3*	$96.00 *B3*		4.65 *B3*	6.80 *B3*							
	Boston, Mass.									6.80 *T8*				13.90 *T8*
	New Haven, Conn.									6.70 *D1* 7.00 *A5*				
	Phoenixville, Pa.					5.15 *P2*		5.15 *P2*						
	Sparrows Pt., Md.								4.325 *B3*	6.25 *B3*	6.425 *B3*	9.125 *B3*		
	Bridgeport, Wallingford, Conn.	$73.50 *N8*	$89.50 *N8*						4.625 *N8*	6.70 *W1*			7.50 *N8*	
	Pawtucket, R. I. Worcester, Mass.									6.80 *N7* 7.10 *A5*				*A5* 13.80 *N7*
MIDDLE WEST	Alton, Ill.								4.50 *L1*					
	Ashland, Ky.								4.325 *A7*					
	Canton-Massillon, Dover, Ohio		$86.50 *R3*	$96.00 *R3*										13.45 *G4*
	Chicago, Ill.	$68.50 *U1*	$84.50 *R3, U1,W8*	$96.00 *R3, U1,W8*	5.45 *U1*	4.60 *U1, W8*	6.75 *U1, Y1*	4.60 *U1*	4.325 *A1, N4,W8*	6.35 *A1,T8*			7.20 *W8*	13.45 *T8*
	Cleveland, Ohio									6.25 *A5,J3*		9.30 *A5*		13.45 *A5*
	Detroit, Mich.			$96.00 *R5*					4.425 *G3,M2*	6.35 *D1,D2, G3,M2,P11*	6.525 *G3*	9.20 *D2, G3*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$68.50 *U1*	$84.50 *U1*	$96.00 *U1, Y1*	5.45 *I3*	4.60 *U1, I3*	6.75 *U1, I3*		4.325 *I3, U1,Y1*	6.35 *I3* 6.25 *Y1*	6.425 *I3, U1,Y1*	9.20 *Y1*	7.20 *Y1, U1*	
	Sterling, Ill.								4.425 *N4*					
	Indianapolis, Ind.									6.40 *C5*				
	Newport, Ky.												7.20 *N5*	
	Middletown, Ohio									6.45 *A7*				
	Niles, Warren, Ohio Sharon, Pa.	$68.50 *C10*	$84.50 *C10*	$96.00 *C10*					4.325 *S1, R3*	6.25 *S1, R3,T4*	6.425 *S1, R3*	9.10 *S1, R3*	7.20 *S1*	13.45 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$68.50 *U1, J3*	$84.50 *J3, U1,C11*	$96.00 *U1, C11*	5.45 *U1*	4.60 *U1, J3*	6.75 *U1, J3*	4.60 *U1*	4.325 *P6*	6.25 *S7,B4*			7.20 *S9*	13.45 *S9*
	Portsmouth, Ohio								4.325 *P7*	6.25 *P7*				
	Weirton, Wheeling, Follansbee, W. Va.					4.60 *W3*			4.325 *W3*	6.25 *F3,W3*	6.425 *W3*	9.10 *W3*		
	Youngstown, Ohio		$84.50 *C10*	$96.00 *Y1, C10*		4.60 *Y1*	6.75 *Y1*		4.325 *U1, Y1*	6.25 *Y1,C5*	6.425 *U1, Y1*	9.30 *Y1*	7.20 *U1, Y1*	13.45 *C5*
WEST	Fontana, Cal.	$76.00 *K1*	$92.00 *K1*	$115.00 *K1*		5.25 *K1*	7.40 *K1*	5.40 *K1*	5.075 *K1*	6.80 *K1*	7.525 *K1*		8.85 *K1*	
	Geneva, Utah		$84.50 *C7*			4.60 *C7*	6.75 *C7*							
	Kansas City, Mo.					4.70 *S2*	6.85 *S2*				6.675 *S2*		7.45 *S2*	
	Los Angeles, Torrance, Cal.		$94.00 *B2*	$116.00 *B2*		5.30 *C7, B2*	7.45 *B2*		5.075 *C7, B2*	8.30 *C1*			8.40 *B2*	
	Minnequa, Colo.					4.90 *C6*			5.425 *C6*					
	Portland, Ore.					5.35 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$94.00 *B2*			5.25 *B2, P9*	7.40 *B2*		5.075 *B2, C7*					
	Seattle, Wash.		$98.00 *B2*			5.35 *B2*	7.50 *B2*		5.325 *B2*					
SOUTH	Atlanta, Ga.								4.525 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$68.50 *T2*	$84.50 *T2*			4.60 *C16, R5,T2*	6.75 *T2*		4.325 *R3, C16,T2*		6.425 *T2*			
	Houston, Lone Star, Tex.	$74.50 *L3*	$89.50 *S2*	$101.00 *S2*		4.70 *S3*	6.85 *S3*				6.875 *S2*		7.45 *S2*	

STEEL PRICES

(Effective Sept. 13, 1966)

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		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized 18 ga.	Enameling 13 ga.	Long Terne 18 ga.	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.325 *B3*	5.325 *B3*				6.375 *B3*	7.875 *B3*			*W6*	† Special coated mfg. terne deduct 95¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 125 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.10. Differential 1.00 lb./0.25 lb. add 85¢.		
	Claymont, Del.													
	Conshohocken, Pa.													
	Coatesville, Pa.	4.375 *A2*	5.375 *A2*				6.425 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.025 *B3*			
	Fairless, Pa.	4.375 *U1*	5.375 *U1*				6.425 *U1*	7.925 *U1*				$8.90 *U1*	$7.60 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.325 *B3*	5.325 *B3*	5.85 *B3*			6.375 *B3*	7.875 *B3*	8.60 *B3*		5.125 *B3*	$8.90 *B3*	$7.60 *B3*	
	Worcester, Mass.										5.325 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										5.20 *L1*			
	Ashland, Ky.	4.325 *A7*		5.85 *A7*	5.90 *A7*									
	Canton-Massillon, Dover, Ohio			5.85 *R1, R3*										
	Chicago, Joliet, Ill.	4.325 *A1, W8*					6.375 *U1*				5.025 *A5, N4, R3*			
	Sterling, Ill.										5.125 *N4*			
	Cleveland, Ohio	4.325 *J3, R3*	5.325 *J3, R3*		5.90 *R3*		6.375 *J3, R3*	7.875 *J3, R3*			5.025 *A5*			
	Detroit, Mich.	4.425 *G3, M2*	5.425 *G3* 5.325 *M2*				6.475 *G3*	7.975 *G3*						
	Newport, Ky.	4.325 *N5*	5.325 *N5*	5.85 *N5*										
	Gary, Ind. Harbor, Indiana	4.325 *J3, U1, Y1*	5.325 *J3, U1, Y1*	5.85 *U1, J3*	5.90 *U1, J3*	6.25 *U1*	6.375 *Y1, U1, J3*	7.875 *U1, Y1*			5.025 *Y1*	$8.80 *J3, U1, Y1*	$7.50 *J3, U1, Y1*	6.65 *U1, Y1*
	Granite City, Ill.	4.525 *G2*	5.525 *G2*	6.05 *G2*	6.10 *G2*								$7.60 *G2*	6.75 *G2*
	Kokomo, Ind.	4.425 *C9*		5.95 *C9*						5.475 *C9*	5.125 *C9*			
	Mansfield, Ohio	4.325 *E2*	5.325 *E2*			6.25 *E2*				*E2*				
	Middletown, Ohio		5.325 *A7*	5.85 *A7*	5.90 *A7*	6.25 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.325 *S1, R3, N3*	5.325 *R3, N3*	5.85 *N3, R3*	5.90 *N3*	6.25 *N3*	6.375 *S1, R3*	7.875 *R3*				$8.80 *R3*	$7.50 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.325 *J3, U1, P6*	5.325 *J3, U1, P6*	5.85 *U1*	5.90 *U1, A1*		6.375 *J3, U1*	7.875 *U1*	8.60 *U1*		5.025 *A5, P6*	$8.80 *J3, U1*	$7.50 *J3, U1*	6.65 *U1*
	Portsmouth, Ohio	4.325 *P7*	5.325 *P7*								5.025 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.325 *W3, W5*	5.325 *W3, W5, F3*	5.85 *W3, W5*		6.25 *W3, W5*	6.375 *W3*	7.875 *W3*				$8.80 *W3, W5*	$7.50 *W3, W5*	6.65 *F3, W5*
	Youngstown, Ohio	4.325 *U1, Y1*	5.325 *Y1*		5.90 *Y1*		6.375 *U1, Y1*	7.875 *Y1*			5.025 *Y1*			
WEST	Fontana, Cal.	5.075 *K1*	6.425 *K1*				7.125 *K1*	8.975 *K1*						
	Geneva, Utah	4.425 *C7*												
	Kansas City, Mo.										5.275 *S2*			
	Los Angeles, Torrance, Cal.										5.825 *B2*			
	Minnequa, Colo.										5.275 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.025 *C7*	6.275 *C7*	6.00 *C7*							5.675 *C7*	$9.55 *C7*	$8.25 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.325 *R3, T2*	5.325 *T2*	5.85 *R3, T2*			6.375 *T2*			5.625 *R3*	5.025 *R3, T2*	$8.90 *T2*	$7.60 *T2*	
	Houston, Tex.										5.275 *S2*			

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(Effective Sept. 13, 1955)

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		BARS						PLATES				WIRE
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				5.575 *B3*	7.425 *B3*	6.80 *B3*					
	Buffalo, N. Y.	4.65 *B3,R3*	4.65 *B3,R3*	5.95 *B5*	5.575 *B3,R3*	7.425 *B3,B5*	6.80 *B3*	4.50 *B3,R3*				6.25 *W6*
	Claymont, Del.							4.50 *C4*		6.30 *C4*		
	Coatesville, Pa.							4.50 *L4*		6.30 *L4*	6.725 *L4*	
	Conshohocken, Pa.							4.50 *A2*	5.575 *A2*		6.725 *A2*	
	Harrisburg, Pa.							5.10 *C3*	5.575 *C3*			
	Hartford, Conn.			6.40 *R3*		7.725 *R3*						
	Johnstown, Pa.	4.65 *B3*	4.65 *B3*		5.575 *B3*		6.80 *B3*	4.50 *B3*		6.30 *B3*	6.725 *B3*	6.25 *B3*
	Fairless, Pa.	4.80 *U1*	4.80 *U1*		5.725 *U1*							
	Newark, N. J.			6.35 *W10*		7.60 *W10*						
	Camden, N. J.			6.35 *P10*								
	Bridgeport, Putnam, Conn.	4.80 *N8*		6.45 *W10*	5.725 *N8*			4.750 *N8*				
	Sparrows Pt., Md.		4.65 *B3*					4.50 *B3*		6.30 *B3*	6.725 *B3*	6.35 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			6.35 *W11* 6.45 *B5,C14*		7.725 *A5,B5*		4.50 *R3*				6.55 *A5, W6*
MIDDLE WEST	Alton, Ill.	4.85 *L1*										6.425 *L1*
	Ashland, Newport, Ky.							4.50 *A7,N5*		6.30 *N5*		
	Canton-Massillon, Mansfield, Ohio	4.75 *R3*		5.90 *R2,R3*	5.575 *R3,T5*	7.425 *R2,R3, T5*		4.50 *E2*				
	Chicago, Joliet, Ill.	4.65 *U1, N4,W8,R3, P13*	4.65 *N4,R3, P13*	5.90 *A5,W10, W8,B5,L2*	5.575 *U1,R3, W8*	7.425 *A5,W8, W10,L2,B5*		4.50 *U1,W8, I3,A1,R3*	5.575 *U1*	6.30 *U1*	6.725 *U1*	6.25 *A5,R3, N4,W7*
	Cleveland, Ohio	4.65 *R3*	4.65 *R3*	5.90 *A5,C13*		7.425 *A5,C13*	6.80 *R3*	4.60 *J3,R3*	5.575 *J3*		6.725 *R3,J3*	6.25 *A5, C13*
	Detroit, Mich.	4.75 *G3*	4.75 *G3*	5.90 *R5* 6.10 *B5,P8* 6.15 *P3*	5.575 *R5* 5.675 *G3*	7.425 *R5* 7.625 *B5,P3 P8*	6.90 *G3*	4.60 *G3*			6.825 *G3*	
	Duluth, Minn.											6.25 *A5*
	Gary, Ind. Harbor, Crawfordsville	4.65 *I3, U1, Y1*	4.65 *I3, U1, Y1*	5.90 *M5,R3*	5.575 *I3, U1, Y1*	7.425 *M5, R3*	6.80 *U1, I3, Y1*	4.50 *I3, U1, Y1*	5.575 *I3*	6.30 *U1, Y1*	6.725 *U1, I3, Y1*	6.35 *M4*
	Granite City, Ill.							4.70 *G2*				
	Kokomo, Ind.											6.35 *C9*
	Sterling, Ill.	4.75 *N4*	4.75 *N4*									6.35 *N4*
	Niles, Warren, Ohio Sharon, Pa.	4.65 *R3,C10*		5.90 *C10*	5.575 *C10*	7.425 *C10*	6.80 *R3*	4.50 *S1,R3*		6.30 *S1*	6.725 *S1*	
	Pittsburgh, Pa. Midland, Pa.	4.65 *J3, U1, C11*	4.65 *J3, U1*	5.90 *A5,C8, C11,J3, W10,B4,R3*	5.575 *U1,C11*	7.425 *A5,C11, W10,C8,R3*	6.80 *J3, U1*	4.50 *J3, U1*	5.575 *U1*	6.30 *U1*	6.725 *J3, U1*	6.25 *A5,J3, P6*
	Portsmouth, Ohio											6.25 *P7*
	Weirton, Wheeling, Follansbee, W. Va.	4.65 *W3*						4.50 *W3,W5*				
	Youngstown, Ohio	4.65 *U1,Y1, C10,R3*	4.65 *U1,Y1, R3*	5.90 *Y1, U1*	5.575 *U1,Y1, C10*	7.425 *Y1,C10* 7.865 *F2*	6.80 *U1,Y1*	4.50 *U1,Y1, R3*		6.30 *Y1*	6.725 *Y1*	6.25 *Y1*
WEST	Emeryville, Cal.	5.40 *J5*	5.40 *J5*									
	Fontana, Cal.	5.35 *K1*	5.35 *K1*		6.625 *K1*		7.50 *K1*	5.15 *K1*		6.95 *K1*	7.375 *K1*	
	Geneva, Utah							4.50 *C7*			6.725 *C7*	
	Kansas City, Mo.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*					6.50 *S2*
	Los Angeles, Torrance, Cal.	5.35 *B2,C7*	5.35 *B2,C7*	7.35 *R3*	6.625 *B2*		7.50 *B2*				7.625 *B2*	7.20 *B2*
	Minnequa, Colo.	5.10 *C6*	5.10 *C6*					5.35 *C6*				6.50 *C6*
	Portland, Ore.	5.40 *O2*	5.40 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.35 *C7* 5.40 *B2,P9*	5.35 *C7* 5.40 *B2,P9*				7.55 *B2*					7.20 *C7*
	Seattle, Wash.	5.40 *B2,P12, N6*	5.40 *B2,P12*				7.55 *B2*	5.40 *B2*		7.20 *B2*	7.625 *B2*	
SOUTH	Atlanta, Ga.	4.85 *A8*	4.85 *A8*									6.45 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	4.65 *T2,C16, R3*	4.65 *T2,C16, R3*				6.80 *T2*	4.50 *T2,R3*			6.725 *T2*	6.25 *R3, T2*
	Houston, Ft. Worth, Lone Star, Tex.	4.90 *S2*	4.90 *S2*		5.825 *S2*		7.05 *S2*	4.85 *L3* 4.60 *S2*		6.40 *S2*	6.825 *S2*	6.50 *S2*

Steel Prices *(Effective Sept. 13, 1955)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, O.
A8 Atlantic Steel Co., Atlanta, Ga.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metal Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Disston & Sons, Inc., Philadelphia

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimmons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G1 Globe Iron Co., Jackson, O.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp, Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N5 Newport Steel Corp., Newport, Ky.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N.
P11 Production Steel Strip Corp., Detroit
P12 Pacific Steel Rolling Mills, Seattle
P13 Phoenix Mfg. Co., Joliet, Ill.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Corp., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw & Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T6 Tremont Nail Co., Wareham, Mass.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Co., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W11 Worcester Pressed Steel Co., Worcester, Mass.

Y1 Youngstown Sheet & Tube Co., Youngstown

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $290 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	17.50	0.25	20.50	4.25	23.00	7.75	25.50	9.00	26.00	10.00	26.50	10.50	28.00	10.75	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	6.00	+9.25	9.00	+5.25	11.50	+1.75	14.00	+1.00	14.50	+0.00	15.00	0.50	16.50	0.25	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Alton, Ill. *L1*	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	15.50	0.25	18.50	4.25	21.00	7.75	23.50	8.50	24.00	9.50	24.50	10.00	26.00	9.75	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Wheeling *W5*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
Indiana Harbor *Y1*	16.50	1.25	19.50	5.25	22.00	8.75	24.50	9.50	25.00	10.50	25.50	11.00	27.00	10.75	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	17.50	2.25	20.50	6.25	23.00	9.75	25.50	10.50	26.00	11.50	26.50	12.00	28.00	11.75	6.50	+8.50	10.50	+6.25	13.00	+3.75	14.50	+2.25
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *R3*	22.0	6.25	26.00	10.25	28.00	13.75	28.50	13.00	29.00	14.00	29.50	14.50	30.00	13.75	.....	.....	.....	.....	.....	.....	.....	.....
Fairless *N2*	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75	.....	.....	.....	.....	.....	.....	.....	.....
Fontana *K1*	10.50	.....	14.50	.....	16.50	.....	17.00	.....	17.50	.....	18.00	.....	18.50	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *J3*	22.00	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75
Alton, Ill. *L1*	20.0	6.25	24.00	10.25	26.00	13.75	26.50	12.50	27.00	13.50	27.50	14.00	28.00	12.75	.....	.....	.....	.....	.....	.....	.....	.....
Sharon *M3*	22.0	6.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	.....	.....	.....	.....	.....	.....	.....	.....
Pittsburgh *N1*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75
Wheeling *W5*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	.....	.....	.....	.....	.....	.....	.....	.....
Wheatland *W4*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	.....	.....	.....	.....	.....	.....	.....	.....
Youngstown *Y1*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75
Indiana Harbor *Y1*	21.0	7.25	25.00	11.25	27.00	14.75	27.50	13.50	28.00	14.50	28.50	15.00	29.00	13.75	.....	.....	.....	.....	.....	.....	.....	.....
Lorain *N2*	22.0	0.25	26.00	12.25	28.00	15.75	28.50	14.50	29.00	15.50	29.50	16.00	30.00	14.75	8.00	+6.00	13.00	+2.75	15.50	+0.25	20.50	4.75

Threads only, buttweld and seamless 2½ pt higher discount. Plain ends, buttweld and seamless, 3-in. and under, 4½ pt higher discount. Buttweld jobbers discount, 5 pct.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb, East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2 in., 1½ pt.; 2½ and 3-in., 1 pt. e.g., zinc price range of over 11¢ to 13¢ would lower discounts; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price over 13.00¢ per lb.

Steel Prices *(Effective Sept. 13, 1955)*

To identify producers, see Key on preceding page

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer *U1*	4.725	5.65	5.825				
So. Chicago *R5*				7.50			
Ensley *T2*	4.725	5.65					
Fairfield *T2*		5.65		7.50		5.625	
Gary *U1*	4.725	5.65				5.625	
Ind. Harbor *I3*	4.725		5.825	7.50		5.525	
Johnstown *B3*		5.65					
Joliet *U1*		5.65	5.825				
Kansas City *S2*				7.90			
Lackawanna *B3*	4.725	5.65	5.825			5.625	
Minnequa *C6*	4.725	6.15	5.825	7.50		5.625	12.40
Pittsburgh *O1*					11.90		12.40
Pittsburgh *P5*							12.40
Pittsburgh *J3*				7.90			
Seattle *B2*				8.40		5.775	12.90
Steelton *B3*	4.725		5.825			5.625	
Struthers *Y1*				7.90			
Torrance *C7*						5.775	
Williamsport *S5*		5.65					
Youngstown *R3*				7.90			

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Fully Processed
Field	8.40	8.60	
Armature	9.35	9.60	10.10
Elect.	9.95	10.20	10.70
Meter	10.95	11.20	11.70
Dynamo	11.85	12.10	12.60
Trans. 72	12.80	13.05	13.55
Trans. 65	13.35	Grain Oriented	
Trans. 58	13.85	Trans. 80	17.45
Trans. 52	14.85	Trans. 73	17.95

Producing points: Beech Bottom (*W5*); Brackenridge (*A5*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville (*A7*).

* Coils 75¢ higher.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence 9-15½ ga.	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Annl'd	Merch. Wire Galv.
	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
Alabama City *R3*	152	162		173	175	7.40	7.80
Aliquippa, Pa. *J3*	152	162				7.40	7.80
Atlanta *A8*	154	167		175	180	7.50	8.025
Bartonville *K2**	154	168		175	181	7.50	8.075
Buffalo *W6*						7.40	7.80
Chicago, Ill. *N4***	152	166		173	179	7.40	8.00
Cleveland *A6*	157					7.40	
Cleveland *A5*						7.40	
Crawfordsville *M4**	154	167		175	175	7.50	8.05
Donora, Pa. *A5*	152	162		173	175	7.40	7.80
Duluth *A5*	152	162		173	175	7.40	7.80
Fairfield, Ala. *T2*	152	162		173	175	7.40	7.80
Galveston *D4*	157						
Houston *S2*	167	170			180	7.85	8.06
Johnstown, Pa. *B3**	152	166			175	7.40	7.80
Joliet, Ill. *A5*	152	162		173	175	7.40	7.80
Kokomo, Ind. *C9*	154	154		175	177	7.50	7.90
Los Angeles *B2**						8.35	8.925
Kansas City *S2*	167	174		178	180	7.85	8.05
Minnequa *C6*	157	167	162	178	180	7.85	8.05
Monessen *P6*	152	162				7.40	7.80
Moline, Ill. *R3*		162	162				
Pittsburgh, Cal. *C7*	171	185			195	8.35	8.75
Portsmouth *P7*						7.40	
Rankin, Pa. *A5*	152	162			175	7.40	7.80
So. Chicago *R3*	152	162	157	173	175	7.40	7.80
S. San Francisco *C6*				197	195	8.35	8.75
Sparrows Pt. *B3**	154			175	181	7.50	8.075
Struthers, O. *Y1*						7.40	7.90
Worcester *A5*	158					7.70	
Williamsport, Pa. *S5*			160				

Galvanized products computed with zinc at 5¢ per lb. Exceptions: *zinc at 12.5¢ per lb; **13¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Buffalo, N. Y. *R7*	7.00	8.95	10.50	12.65	15.35
Carnegie, Pa. *S9*		8.95	10.50	12.65	15.35
Cleveland *A5*	7.00	8.95	10.50	12.65	15.35
Detroit *D1*	7.10	9.05	10.60	12.75	
Detroit *D2*	7.10	9.05	10.60		
Harrison, N. J. *C11*			10.00	12.95	15.65
Indianapolis *C5*	7.15	9.10	10.50	12.65	15.35
New Castle, Pa. *B4*	7.00	8.95	10.50	12.65	
New Haven, Conn. *D1*	7.45	9.25	10.80	12.95	
Pawtucket, R. I. *N7*	7.55	9.25	10.80	12.95	15.65
Pittsburgh *S7*	7.00	8.95	10.50	12.65	15.35
Riverdale, Ill. *A1*	7.10	8.95	10.50	12.65	15.35
Sharon, Pa. *S1*	7.00	8.95	10.50	12.65	15.35
Trenton *R4*					
Wallingford *W1*	7.45	9.25	10.80	12.95	15.65
Warren, Ohio *T4*	7.00	8.95	10.50	12.65	15.35
Weirton, W. Va. *W3*	7.10	8.95	10.50		
Worcester, Mass. *A5*	7.55	9.25	10.80	12.95	15.65
Youngstown *C5*	7.00	8.95	10.50	12.65	15.35

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	30.87	36.51	29.94	
	2½	12	41.57	49.16	40.31	
	3	12	47.99	56.76	46.54	
	3½	11	56.03	66.27	54.34	
	4	10	74.41	88.00	72.16	
National Tube	2	13	30.87	36.51	29.94	
	2½	12	42.57	49.16	40.31	
	3	12	47.99	56.76	46.54	
	3½	11	56.03	66.27	54.34	
	4	10	74.41	88.00	72.16	
Pittsburgh Steel	2	13	30.87	36.51		
	2½	12	41.57	49.16		
	3	12	47.99	56.76		
	3½	11	56.03	66.27		
	4	10	74.41	88.00		

WAREHOUSES

Base price, f.o.b., dollars per 100 lb.

Cities	City Delivery Charge	Sheets Hot-Rolled	Sheets Cold-Rolled	Sheets Galvanized (18 gage)	Strip Hot-Rolled	Strip Cold-Rolled	Plates	Shapes Standard Structural	Bars Hot-Rolled	Bars Cold-Finished	Alloy Bars Hot-Rolled 4615 As rolled	Alloy Bars Hot-Rolled 4140 Annealed	Alloy Bars Cold-Drawn 4615 As rolled	Alloy Bars Cold-Drawn 4140 Annealed
Baltimore	$.10	7.03	8.32	9.10	7.65	.....	7.21	7.93	7.61	8.62	14.38	13.44-13.96	16.36	16.29-16.49
Birmingham	.15	6.80	7.93	8.85	7.06	.....	6.99	7.28	7.08	9.35	.....	.....	.....	.....
Boston	.10	7.70	8.81	10.27	7.94-7.96	10.30	7.89	8.13	7.83	9.53	13.65-13.80	13.40-13.45	16.65	16.50
Buffalo	.30	6.80	8.05	9.77	7.15	.....	7.15	7.40	7.10	7.90	.....	13.10	.....	16.15
Chicago	.25	6.80	7.93	8.50	7.06	.....	6.99	7.28	7.08	7.75	13.20	12.85	16.05	15.90
Cincinnati	.25	6.92	7.92	8.90	7.30	.....	7.28	7.75	7.32	8.05	13.44	13.09	16.29	16.14
Cleveland	.30	6.80	7.93	8.85	7.16	.....	7.16	7.61	7.14	7.85	.....	12.91	.....	15.96
Denver		8.60	10.80	11.22	8.90	.....	8.60	8.75	8.90	9.82	.....	.....	.....	17.97
Detroit	.25	6.99	8.12	8.78	7.34	8.15	7.27	7.75	7.36	8.04	13.40	13.05	16.25	16.10
Houston		7.85	8.75	10.40	8.15	.....	7.80	8.20	8.25	9.85-9.95	14.35	14.00	17.15	16.80
Kansas City	.20	7.47	8.60	9.17	7.73	.....	7.66	7.95	7.75	8.52	.....	13.52	.....	.....
Los Angeles	.10	8.05	10.80	11.00	8.35	.....	8.05	8.30	8.05	11.25	.....	14.25	.....	17.85
Memphis	.10	7.12	8.25	.....	7.38	.....	7.31	7.60	7.40	9.15	.....	.....	.....	.....
Milwaukee	.25	6.89	8.02	8.59	7.15	.....	7.08	7.45	7.17	7.94	.....	12.94	.....	15.99
New Orleans	.15	7.20	8.35	.....	7.45	.....	7.40	7.70	7.50	9.50	.....	.....	.....	.....
New York	.10	7.46	8.68	9.44	8.07	9.95	7.76	7.99	7.96	9.48	13.63	13.28	16.48	16.33
Norfolk	.20	7.25	.....	.....	7.65	.....	7.45	7.95	7.65	9.50	.....	.....	.....	.....
Philadelphia	.10	7.14	8.42	9.35	7.67	.....	7.37	7.74	7.64	8.46	13.51	13.16	16.36	16.21
Pittsburgh	.25	6.80	7.93	9.20	7.16	9.00	6.99	7.28	7.08	7.85	13.20	12.85	16.05	15.90
Portland		7.00-8.60	8.80	10.65	8.60	.....	7.75	7.85-8.15	7.95	11.80	.....	15.00	.....	17.50
Salt Lake City	.20	.....	10.60	.....	9.35	.....	.....	9.20	9.15	.....	.....	.....	.....	.....
San Francisco	.10	8.10	9.65	10.15	8.35	.....	8.05	8.25	8.05	11.20*	.....	14.25	.....	17.85
Seattle	.00	8.55	10.40	10.80	8.65	.....	8.20	8.30	8.35	11.70	.....	14.60	.....	17.65
St. Louis	.25	7.00	8.47	9.19	7.35	.....	7.28	7.68	7.37	8.14	13.49	13.14	16.35	16.19
St. Paul	.25	7.46	8.50-9.14	9.16	7.72	.....	7.65	7.94	7.74	8.51	.....	13.51	.....	16.38

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.

Exceptions: (1) 1500 to 9999 lb. (2) 1000 lb or over. (3) $.25 delivery. (4) 1000 to 1999 lb, $.25 delivery.

* Plus analysis charge.

Miscellaneous Prices

(Effective Sept. 18, 1955)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb
18	4	1	—	—	$1.60
18	4	1	—	5	2.305
18	4	2	—	—	1.765
1.5	4	1.5	8	—	.96
6	4	2	6	—	1.35
6	4	2	5	—	1.105

High-carbon chromium	.77
Oil hardened manganese	.45
Special carbon	.39
Extra carbon	.33
Regular carbon	.275

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb, f.o.b.

	Cladding	Plate (*A5, J2, LA*) 10 pct	Plate (*A5, J2, LA*) 15 pct	Plate (*A5, J2, LA*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	304	30.30	33.15	36.05	32.50
	316	35.50	38.45	41.40	47.80
	321	32.60	34.85	37.75	37.25
	347	34.40	37.90	41.40	48.25
	405	25.80	29.60	33.35	
	410, 430	25.30	29.10	32.85	

LAKE SUPERIOR ORES

51.50% Fe; natural content, delivered lower Lake ports. Prices effective for 1955 season.

	Gross Ton
Openhearth lump	$11.25
Old range, bessemer	10.40
Old range, nonbessemer	10.25
Mesabi, bessemer	10.25
Mesabi, nonbessemer	10.10
High phosphorus	10.00

COKE

Furnace, beehive (f.o.b. oven) Connellsville, Pa.	Net-Ton $13.00 to $13.50
Foundry, beehive (f.o.b. oven) Connellsville, Pa.	$16.00 to $16.50
Foundry, oven coke	
Buffalo, del'd	$28.08
Chicago, f.o.b.	24.50
Detroit, f.o.b.	26.25
New England, del'd	26.05
Seaboard, N. J., f.o.b.	24.50
Philadelphia, f.o.b.	24.00
Swedeland, Pa., f.o.b.	24.00
Plainesville, Ohio, f.o.b.	25.50
Erie, Pa., f.o.b.	25.00
Cleveland, del'd	27.42
Cincinnati, del'd	26.56
St. Paul, f.o.b.	25.75
St. Louis, f.o.b.	26.00
Birmingham, f.o.b.	22.65
Lone Star, Tex., f.o.b.	19.50

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	23.00	40	100, 110	9.90
20	72	22.25	35	110	9.90
16 to 18	72	22.50	30	110	10.05
14	72	23.00	24	72 to 84	10.30
12	72	23.50	20	90	10.10
10	60	24.25	17	72	10.35
7	60	24.50	14	72	10.85
8	60	27.25	12	60	11.75
4	40	30.25	10	60	11.90
3	40	32.00	8	60	12.10
2½	30	33.75			
2	24	52.50			

* Prices shown cover carbon nipples.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts

	Discount Less Case	Discount C.
½ in. & smaller x 4 in. & shorter	+5	17
½ in. & smaller x 6 in. & shorter	+12	11
9/16 in. & ⅝ in. x 6 in. & shorter	+13	10
⅝ in. & larger x 6 in. & shorter	+16	7
All diam. longer than 6 in.	+25	net
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	+10	13
Lag, all diam. x 6 in. & shorter	+2	18
Lag, all diam. longer than 6 in.	+11	13
Plow bolts	18	18

Nuts, H.P., C.P., reg. & hvy.

	Base Discount	Discount, Case or Keg
⅝" or smaller	55	64
¾" to 1¼" inclusive	55	63
1⅜" to 1½" inclusive	57	65
1⅝" and larger	51	61

C.P. Hex. regular & hvy.

⅝" and smaller	55	64
¾" and larger	51	61

Hot Galv Nuts (all types)

⅝" or smaller	38	50
¾" to 1⅛" inclusive	36	49

Finished, Semi-finished, Slotted or Castellated Nuts

⅝" and smaller	55	66
¾" and larger	51	63

Rivets

	Base per 100 lb
½ in. and larger	$9.95
	Pct Off List
7/16 in. and smaller	32

Cap Screws

	Discount Bright	Discount H.C. Heat Treated
New std. hex head, packaged ¼" thru ½" diam. x 6" and shorter	34	20
9/16 and ⅝" x 6" and smaller and shorter	31	16
¾", ⅞", 1" x 6" and shorter	8	+11
New std. hex head, bulk* ¼" thru ½" diam. x 6" and shorter	49	41
9/16" and ⅝" diam. x 6" and shorter	48	39
¾", ⅞", 1" x 6" and shorter	31	20

*Minimum quantity per item:
15,000 pieces ¼", 5/16", ⅜" diam.
5,000 pieces 7/16", ½", 9/16", ⅝" diam.
2,000 pieces ¾", ⅞", 1" diam.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Discount Stove Bolts
Packaged, package list	27	38
Bulk, bulk list		
Quantity		
¼-in. diam. & under	25,000-200,000	20	61
5/16-in. diam. & larger	15,000-100,000	20	61
All diam. over 3 in. long	5,000-100,000	..	61

Machine Screw & Stove Bolt Nuts

	Discount Hex	Discount Square
Packaged, package list	34	27
Bulk, bulk list		
Quantity		
⅜-in. diam. & smaller	25,000-200,000	18	20

CAST IRON WATER PIPE INDEX

Birmingham	109.3
New York	121.5
Chicago	126.0
San Francisco-L. A.	131.1

August 1955 value, Class B or heavier, 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick *Carloads per 1000*

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$122.00
No. 1 Ohio	.....
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	.....
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	18.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$128.00
Childs, Hays, Pa.	133.00
Chicago District	138.00
Western Utah	.....
California	.....
Super Duty Hays, Pa., Athens, Tex., Windham	145.00
Curtner, Calif.	163.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	21.00
Silica cement, net ton, bulk, Hays, Pa.	24.00
Silica cement, net ton, bulk, Chicago District, Ensley, Ala.	22.00
Silica cement, net ton, bulk, Utah and Calif.	.....

Chrome Brick *Per net ton*

Standard chemically bonded, Balt.	$86.00
Standards chemically bonded, Curtner, Calif.	96.25
Burned, Balt.	80.00

Magnesite Brick

Standard Baltimore	$109.00
Chemically bonded, Baltimore	97.50

Grain Magnesite *St. ⅝-in., grains*

Domestic, f.o.b. Baltimore in bulk fines removed	$64.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
in bulk	40.00
in sacks	46.00

Dead Burned Dolomite *Per net ton*

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$15.00
Midwest	15.00
Missouri Valley	14.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.l.f. New York, ocean bags	11.25¢
Canadian sponge iron, Del'd in East, carloads	9.5¢ to 10.75¢
Domestic sponge iron, 98+% Fe, carload lots	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 00.8+% Fe	83.0¢ to $1.45
Aluminum	31.5¢
Brass, 10 ton lots	29.50¢ to 36.50¢
Copper, electrolytic	57.75¢
Copper, reduced	57.75¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99% min., and quality, del'd	$3.60
Lead	23.50¢
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	89.50¢
Nickel, annealed	96.50¢
Nickel, spherical, unannealed	93.50¢
Silicon	43.50¢
Solder powder 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	91.0¢
Stainless steel, 316	$1.10
Tin	14.04¢ plus metal value
Tungsten, 99% (65 mesh)	$4.50
Zinc, 10 ton lots	17.5¢ to 25.0¢

machines start
lubrication starts
savings start!

Call it automation—call it cybernetics—or call it just plain good business sense—no matter what name you tack onto it, it's saving thousands of dollars every year.

Example: A large machine tool plant in the East employed 42 full time lubrication men to service some 4,000 machines. These machines were highly complex gear cutters, milling machines, drill presses, machine tools capable of producing work to the closest tolerances. Lubrication was so complex that despite the greatest care some bearings were missed, some over-lubricated. Maintenance and replacement costs were high—too high.

Then an Alemite Lubrication Representative was called in. After a thorough study of the plant and the problems, he came up with a simple sound recommendation. Alemite Oil-Mist was installed on some of the machines—results were carefully observed. Then—savings were so impressive that a budgeting program was set up immediately to equip every major machine in the plant!

Now, the program is well under way and hundreds of machines are completely equipped with Alemite Oil-Mist, all paid for by savings. And, despite the fact that the plant has expanded and now runs 4,800 machine tools, the number of maintenance men assigned to lubrication has been reduced from 42 to only 16 because Oil-Mist lubrication is constant and automatic, starts when the machines start. Lubrication costs are way down, bearing life is extended, and production is up, thanks to Oil-Mist.

Here's the unit that brings these savings to any machine! This is the heart of the Alemite Oil-Mist system. It atomizes oil into tiny, airborne particles that are distributed to bearings through tubing. These form a continuous, uniform film of oil that lubricates and cools the bearing surfaces.

FREE—the complete story of Oil-Mist—how it can bring these savings to any machine in your plant. Specifications, typical installations, case histories.

Three types of fittings allow the use of Alemite Oil-Mist on any bearing—any machine!

1. Oil-Mist fittings bring the most efficient lubrication in the world to roller, ball, needle—or any anti-friction type of bearing.

2. Oil-Mist Spray fittings are recommended for open and enclosed gears and chains. Allows for concentrated application where needed.

3. Oil-Mist Condensing fittings are applied to plain bearings, slides, ways, vees, cams, and rollers. Completely condense Oil-Mist.

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1850 Diversey Parkway, Chicago 14, Illinois

Gentlemen: Please send me complete information on Alemite Oil-Mist. No obligation, of course.

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Company_____

Address_____

City_____ Zone____ State_____

Ferroalloy Prices

(Effective Sept. 13, 1955)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd, 65-72% Cr, 2% max Si.

0.025% C ..	36.00	0.15% C ... 32.75
0.025% C, Simplex ..	34.50	0.20% C ... 33.50
		0.50% C ... 33.25
0.06% C ...	34.50	1.00% C ... 33.00
0.10% C ...	34.00	3.00% C ... 32.75
66-69% Cr, 4-9% C		24.75
62-66% Cr, 4-6% C, 6.9% Si		25.60

S. M. Ferrochrome

Contract prices, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60.55% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	25.85
Ton lots	28.00
Less ton lots	29.50

High Nitrogen Ferrochrome

Low-carbon type 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 3¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.18
0.50% max. C	1.16
9 to 11% C	1.25

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed, lump 4-in. x down, 23.50¢ per lb contained Cr plus 11.00¢ per lb contained Si. Bulk 2-in. x down, 23.50¢ per lb contained Cr plus 11.00¢ per lb contained Si. Bulk 1-in. x down, 23.65¢ per lb contained Cr plus 11.20¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	20.50
Ton lots	23.60
Less ton lots	25.10

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 55-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 39-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	16.60
Ton lots	18.10
Less ton lots	19.35

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 45 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	17.50
Ton lots to carload packed	18.25
Less ton lots	19.50

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	9.50
Clairton, Pa.	9.50
Sheridan, Pa.	9.50
Philo, Ohio	9.50

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	11.85
Ton lots packed	13.65

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$84.00
19 to 21%	3% max.	86.00
21 to 23%	3% max.	88.50
23 to 25%	3% max.	91.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.00
Ton lots	43.50

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	30.00
Ton lots	32.00
250 to 1999 lb	34.00
Premium for hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ..... $1.35¢

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	32.00	33.85	35.05
0.17% max. C	29.95	31.80	33.80
0.15% max. C	28.45	30.30	31.50
0.30% max. C	26.95	28.80	30.00
0.50% max. C	26.45	28.30	29.50
0.75% max. C, 80-85% Mn, 5.0-7.0%Si	23.45	25.30	26.50

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢.

Carload bulk	11.00
Ton lots	12.65
Briquet contract basis carloads, bulk, delivered, per lb of briquet	12.45
Ton lots, packed	14.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk Iowa, or Wenatchee, Wash., $85.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $88.00. Add $1.00 per ton for each additional 0.50% Si up to and including 17%. Add $1.45 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots	Carloads
96% Si, 2% Fe	20.10	18.00
97% Si, 1% Fe	20.60	18.50

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si briquets.

Carloads, bulk	6.55
Ton lots	8.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.40
50% Si	12.00	85% Si	16.10
65% Si	13.50	90% Si	17.25

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Ferrovanadium

35-55% contract, basis, delivered, per pound, contained V.

Openhearth	$3.00-$3.10
Crucible	3.10- 3.20
High speed steel (Primos)	3.20- 3.25

Alsifer, 20% Al, 40% Si, 40% Fe,

Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.35¢
Ton lots	11.50¢

Calcium molybdate, 46.3-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.28

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb con't Cb plus Ta. ... $4.65

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo.. $1.46

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton..... $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots..... $1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton.....$177.00

Ferrotungsten, ¼ x down, packed, per pound contained W, ton lots, f.o.b. $3.45

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.27
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.24

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	15.50¢
Ton lots, packed lump	16.75¢
Less ton lots, lump packed	17.25¢

Vanadium Pentoxide, 86 - 89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium contract basis, per lb of alloy.

35-40%, f.o.b. freight allowed, carloads, packed	25.25¢
12-15%, del'd, lump, bulk-carloads	8.00¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed. B, 3.14%, Si, 40-45%, per lb contained 2.... $5.25

Bortam, f.o.b. Niagara Falls

Ton lots, per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50%, max. Al, 0.50% max. C, 1 in., x D, Ton lots... $1.20
F.o.b. Wash., Pa.; 100 lb up

10 to 14% B	.85
14 to 19% B	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over

No. 1	$1.00
No. 79	50¢

Manganese - Boron, 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

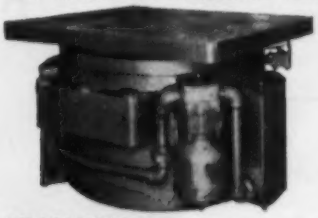
Ton lots	$1.44
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots..... $2.05

Silcas, contract basis, delivered.
Ton lots ..... 45.00¢

BAKER **DIE CUSHIONS**
FOR ALL TYPE POWER PRESSES

PNEUMATIC & HYDROPNEUMATIC . . .
WITH OR WITHOUT LOCKING DEVICES



NEW PATENTED CL TYPE PNEUMATIC DIE CUSHION
WITH INTEGRAL HYDRAULIC LOCKING DEVICE

- ★ BUILT MORE COMPACTLY FOR SMALL SPACES
- ★ FEWER PARTS
- ★ COMPLETELY SELF CONTAINED
- ★ LOWER INITIAL COST
- ★ LESS MAINTENANCE COST

With the standard type locking device mounted below a pneumatic cushion, it is necessary to mount the press over a pit because the over-all height of a standard type cushion is too great. Usually this compact Baker Cushion requires *no pit*. The cushion is mounted in the press through the bed opening with minimum loss of time and production. For full information write

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Looking for a dependable source of supply to keep an un-interrupted flow of parts coming in on scheduled time? Our reputation is behind every promise date. Send blueprints or samples for quotation.

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Have something new on the market or do you just want to tell why your product does the job better?

Either way, your advertisement in The Iron Age carries more weight and reaches more prospects. Over 1000 advertisers will sell through these pages in The Iron Age this year.

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ABRASIVES
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Really gleam, don't they? That's why "Certified" Samson Shot and Angular Grit cut your blast cleaning costs. They do a *good* job and do it *fast!* That's because "Certified" Abrasives are extra-tough . . . offering a uniformity, controlled analysis and quality unequalled in the production of chilled iron abrasives. The certificate with every shipment is your assurance you're getting the best. Cut your cleaning costs now—switch to "Certified" Abrasives!

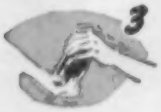
ACCEPTED AND USED FOR OVER 60 YEARS

PITTSBURGH CRUSHED STEEL CO.
Pittsburgh, Pa.
FEMA
STEEL SHOT & GRIT CO.
Boston, Mass.

PICKLING TANK TEST
in 3 minutes with FERRO PICKLE PILLS

As easy as 1...2...3. Any workman who can tell red from green and count to ten can test the exact strength of pickling solutions . . . the exact percentage of iron. That's why Ferro Pickle Pills have been standard equipment in the best pickling rooms for years. They're efficient, economical and easy to use.

Ferro Pickle Pills provide a quick, accurate test to augment periodic titration testing, or as a "test within a test". They assure full-capacity cleaning with fewer rejects because tank solutions can be controlled at the required strength. You save money by eliminating costly, premature dumping of tanks.



There's a Ferro Pickle Pill for almost every pickle room need . . . a simple, sure way of determining the solution percentage of sulphuric acid, muriatic acid, alkali and metal cleaning tanks ...or the iron content of any solutions. Try Ferro Pickle Pills in your pickling room. One test will convince you.

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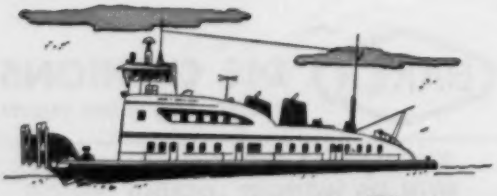

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MILLER WELDERS
are preferred

Miller Selenium Rectifier type D.C. Arc Welders are available in four wide range models. For complete information on these and other Miller arc and spot welders, contact us today at no obligation, of course.

St. Louis Shipbuilding and Steel Co., largest builders of inland towboats in the world, require welds that will withstand a maximum amount of abuse.

Look anywhere in St. Louis Shipbuilding's mammoth yard and you will see Miller Selenium Rectifier type D.C. arc welders — in single units or in batteries of four and five for greater output.

For dependable welds, St. Louis Shipbuilding prefers the Miller S.R. welder. Miller is glad to be aboard.

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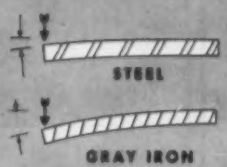
FACTS THAT FIGURE in lower costs

FACT:
Steel is two to three times as strong as gray iron.

STEEL
Tensile strength 61,800 psi

GRAY IRON
Tensile strength 20 to 30,000 psi

FACT:
Steel is two and one half times as rigid as gray iron.



STEEL

GRAY IRON

FACT:
Steel costs only a third as much as gray iron.

STEEL GRAY IRON

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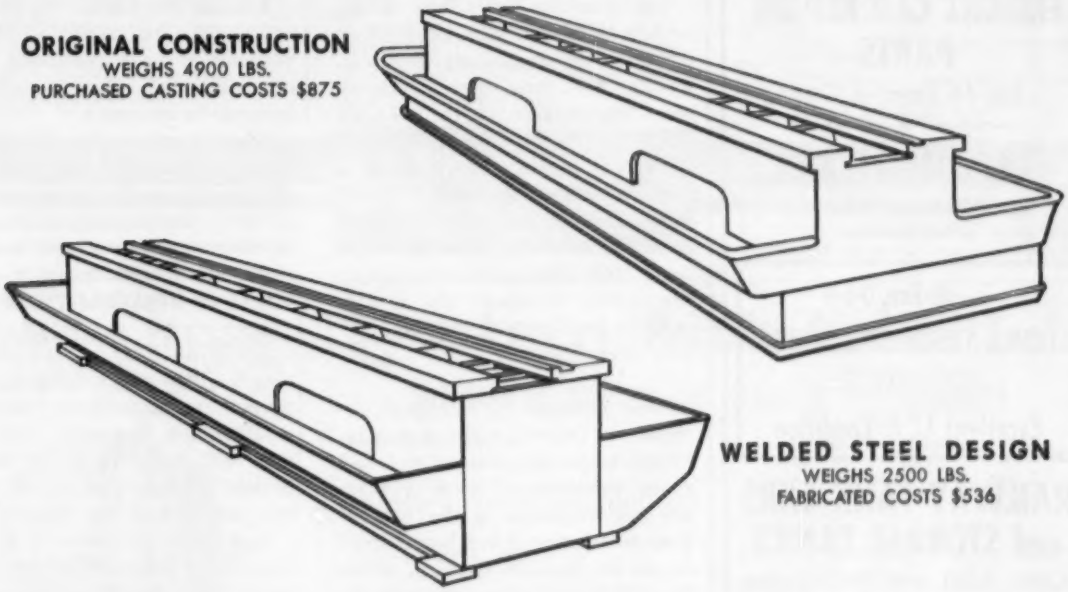

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CUTS COST 39%... CUTS WEIGHT 51%

COMPARE the two designs for a machine tool base. The steel design takes 2400 pounds less material, yet is actually 40% more rigid. The increased rigidity means more accurate alignment of bed ways . . . greater precision to meet today's close tolerances.

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Lincoln's method for converting designs to welded steel is in WELDesign manual. For details, write . . .

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THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Detroit Demand Holds . . . Used machinery business in the Detroit area is continuing to hold at a present rapid pace despite the mid-summer spurt that was experienced here. In some cases, dealers have found a great demand for certain types of equipment which is just not available.

The Machine Tool Show is expected to have a very good effect on the used machinery business. For the first time since the shows were inaugurated, there is a used machinery booth there.

Dealers expect to show prospective customers the advantage of using older machinery to obtain good results at relatively low cost. Most used machinery people are optimistic about the results that they will receive from the display investment.

Seek Presses . . . Biggest demand in Detroit right now continues to be for presses and tool room equipment. Some presses are not available at the present time and dealers have been forced to go to outside sources. Even then, it is not always possible to get what a customer wants.

The demand for boring mills, surface grinders and radial drills is also heavy here. Dealers report that inquiries are no heavier than usual but when a customer does call, he usually buys a machine.

Auto Change Helps . . . One source attributes the continued good business to automotive suppliers who are getting ready for their fall and winter programs. He expects that the present increase in activity will last well into 1956.

At the same time, there is a certain amount of replacement that is always going on and this adds to the overall market strength. In the meantime, pattern makers have already started to do their work on the 1957 models for the auto industry. All of this activity adds to the strong tone of the market. New machinery sales are also up in the area. One of the biggest concerns in Michigan says that it sold more new tool room equipment in August than at any other time this year.

Release Machines . . . In some cases, this has added to the inventory of used machines, some of them much older models that have to be scrapped.

Older type equipment, that is machinery built before 1940, is a drug on the market. Over a period of time, dealers accumulate a lot of this machinery and some of them have been recently scrapping it on a wholesale basis.

See Fine Year . . . Used machinery men are hoping that the normal season pattern, which was modified for the better this summer, will stand up in the fall. A normal pickup now would make the year a fine one indeed.

And sales do figure to hold or improve. Business generally is good. The delivery situation puts used machinery in a particularly favorable position. With solid order bookings and companies spilling over into new fields, many plants just can't wait for new equipment.

Come to Dealer . . . One dealer recently had a request for 4 large bed presses—400 to 1500 ton jobs. They were needed for automotive work with an overseas plant as the probable destination. The dealer checked his lines all over the country and was able to offer something close to the specified models.

For new presses of this size, the buyer would have had to wait a year or more. That's a long time to sit by watching a hot market go to competitors. Fast service at a time like this makes a lasting impression on buyers.

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8' x 3/16" Bertsch Initial Type
12' x ¼" Hilles & Jones Pyramid Type
14' x ⅜" Bertsch Initial Type Bending Roll
20'x 1" Hilles & Jones Pyramid Type Bending Roll
BRAKES—LEAF TYPE
8' x ¼" Dries & Krump Size 196
12 x ⅜" Dreis & Krump, Motor Driven
BRAKES—PRESS TYPE
12' All Steel Press Brake, 250 ton Capacity
10' x 3/16" Cincinnati No. 78
10' x ⅜" Cincinnati No. 100-10
CAR PULLER
Clyde Double Drum Electric Car Puller, Capacity 42,750# Max. Starting Pull
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5 ton P&H Trav-Lift	20' Span 220/440 A.C.
5 ton Northern	60' Span 220/3/60 A.C.
5 ton Toledo	60' Span 230 Volt D.C.
5 ton Cleveland	90' Span 230 Volt D.C.
10 ton P&H	35' Span 230 Volt D.C.
10 ton Niles	52' Span 230 Volt D.C.
10 ton Shaw	72' Span 230 Volt D.C.
10 ton Northern	75' Span 230 Volt D.C.
10 ton P&H	90' Span 230 Volt D.C.
30 ton Toledo	75' Span 550/3/60 A.C.

DIEING MACHINE
25 ton Henry & Wright, 1¼" Stroke, Double Roll Feed, Scrap Shear
DRAW BENCHES
50,000# Standard Double Draw, 40' Length of Draw
100,000# Standard Double Draw, 25' Length of Draw
FORGING MACHINES
1" to 5" Acme, Ajax, National
4", 5", 7½" National High Duty, Air Clutch
FURNACES
Thor-Monic Induction Heater Model 1400
1¼-ton Herault Side Charge, With Transformer

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STEAM FORGING—800 lb. to 20,000 lb.
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52" McKay 17 Rolls 3⅜" Dia.
64" Aetna Standard 17 Rolls 4¼" Dia.
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72" McKay 15 Rolls 4½" Dia.
PRESSES—HYDRAULIC
350 ton RD Wood Hydr. Jogging Press
500 ton HPM Fastraverse 4-Col., Press, 42" Stroke, 54" Daylight Bolster 48" x 72"
1257 ton Baldwin Southwark Forging Press, 36" Stroke Main Ram, 54" x 41" Bet. Columns
1200 ton Lake Erie 4-Column, 36" Stroke 48x48" Bet. Columns, 12' RtoL Overall of Bed
PUNCH & SHEAR COMBINATIONS
Style EF Cleveland, 36" Throat, Punch 1¼" thru 1" No. 16 Pels Universal Ironworker with Coper & Notcher
Style W Cleveland Single End, 60" Throat, 812 Ton
ROLL—PLATE STRAIGHTENING
84" Hilles & Jones, Six Rolls 10" Dia., M.D.
ROLLING MILLS
10" x 14" United Three Stand Two High
12" x 16" Waterbury Farrel Temper Mill
16" x 20" Waterbury Farrel Single Stand 2-High
20" x 36" Poole Two Stand Two High
22" x 58" Three High Breakdown Mill
18" x 60" 3-High Merchant Bar Mill
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#18 Marvel Hydr. Sawing Mch. Cap. 18"x18" Complete with accessories
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80" x ⅜" Pels
SHEARS—ANGLE
6x6x1" Long & Allstatter Size B
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SHEAR—BAR
#9 Buffalo Bar Cutter, Capacity 8" Sq., 3⅜" Rd.
SHEARS—ROTARY
3/16" Quickwork Rotary Shear, 36" Throat
¼" Kling #250, With Flanging Attachment
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¼" Kling #750, 48" Throat, Circle Cutting Attach.
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38" Parson Coil & Sheet Slitter
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Sutton 5-Roll, Capacity 4½" to 12¾" Pipe
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Model A32 Reed Thread Roller, Horizontal, Capacity Approx. Work Dia In-feed. Standard Equip. 1" to 4"
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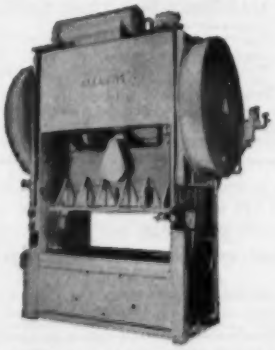

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18" Betts-Crank Slotter, m.d.
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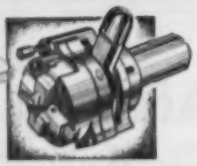

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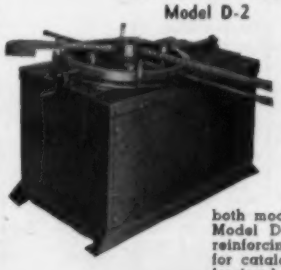

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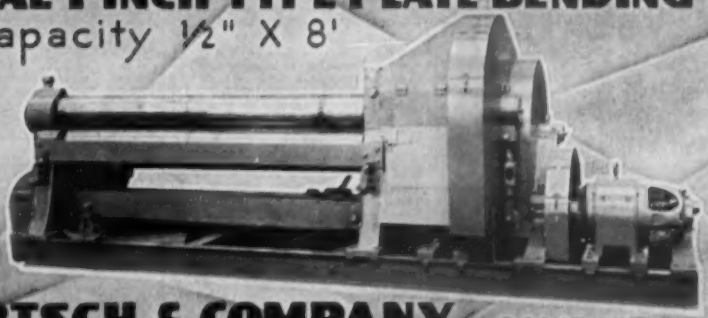

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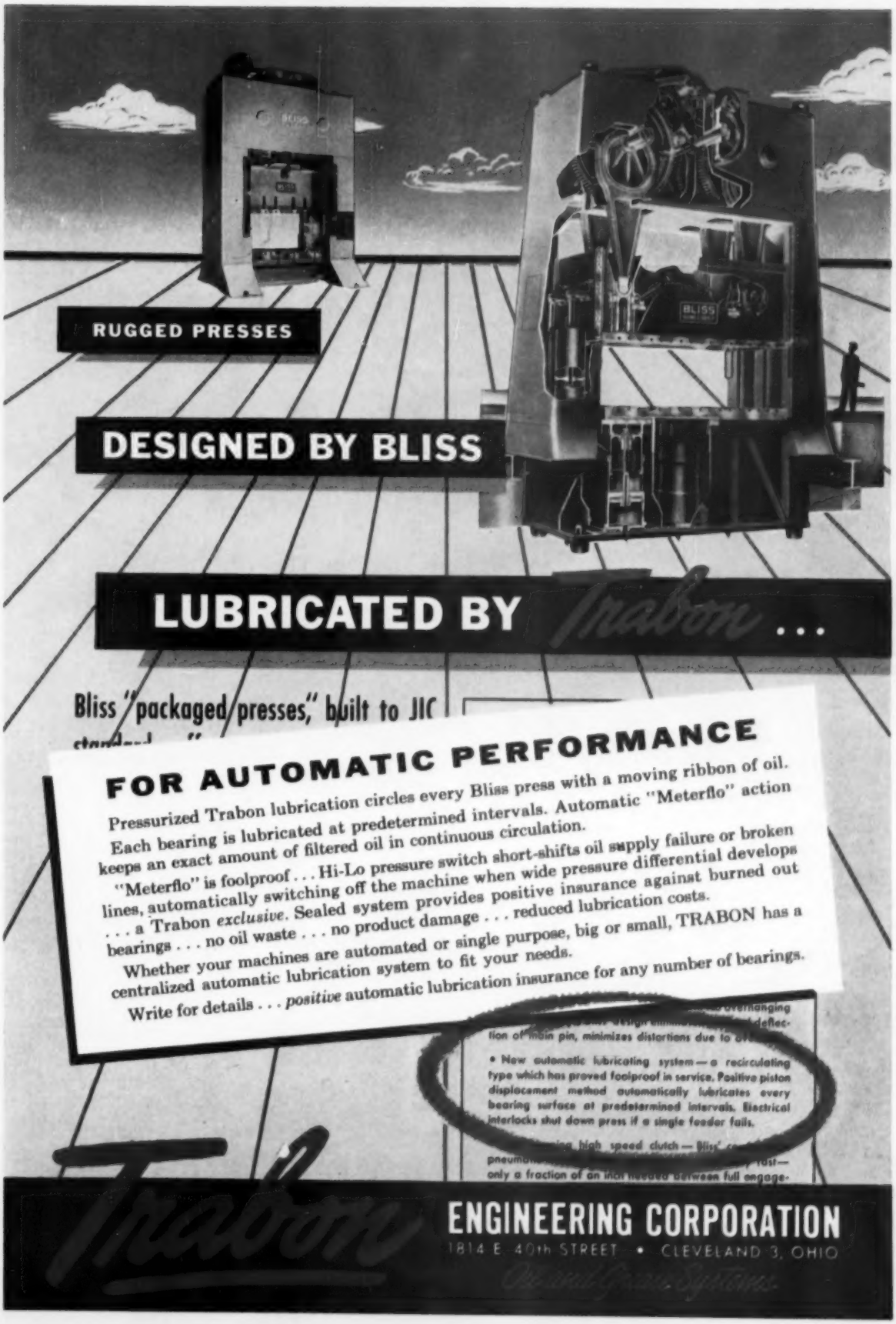
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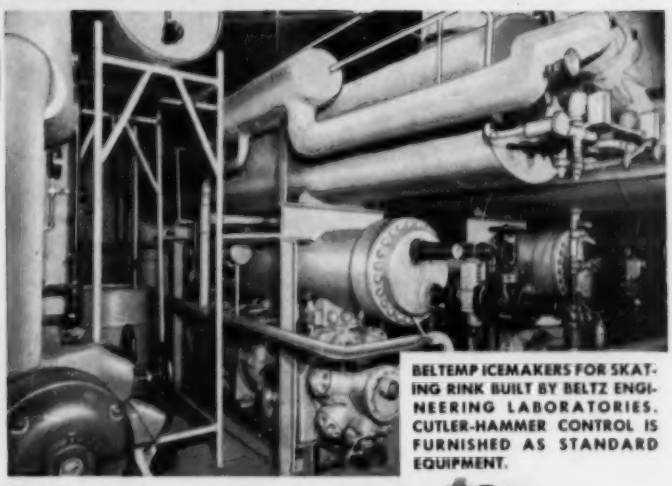

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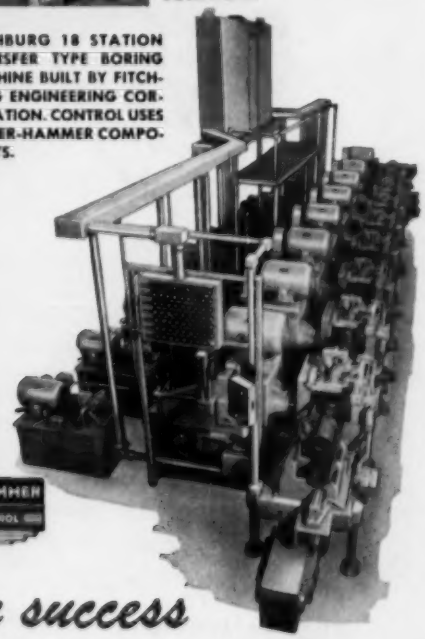

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